S. HRG. 101-831

BEACHES ENVIRONMENTAL ASSESSMENT, CLOSURE, AND HEALTH ACT OF 1990

HEARING

BEFORE THE

SUBCOMMITTEE ON
SUPERFUND, OCEAN, AND WATER PROTECTION

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

S. 2706

A BILL TO IMPROVE THE PUBLIC SAFETY AND QUALITY OF MARINE RECREATIONAL WATERS

JUNE 28, 1990

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CONTENTS

Page

Lautenberg, Hon. Frank R., U.S. Senator from the State of New Jersey, opening statement 1

WITNESSES

Cabelli, Victor, professor of microbiology, University of Rhode Island 23
Prepared statement 60
Hershkowitz, Allen, staff scientist, Natural Resources Defense Council 13
Prepared statement 45
Hughes, Hon. William, a Representative in Congress from the State of New Jersey 8
Neafsey, Edward, special assistant to the commissioner, New Jersey Department of Environmental Protection 24
Letter to Senator Lautenberg 27
Prepared statement 64
Svenson, Richard, director, Bureau of Community Sanitation and Food Protection, New York State Department of Health 29
Wayland, Hon. Robert, III, Deputy Assistant Administrator for Water, Environmental Protection Agency 11
Prepared statement 37

OTHER MATERIAL

National Association of Attorneys General, resolution of 3
S. 2706 81
Statements:
Bradley, Hon. Bill, U.S. Senator from the State of New Jersey 5
Maine Department of Environmental Protection 70
Office of Technology Assessment 73

BEACHES ENVIRONMENTAL ASSESSMENT, CLOSURE, AND HEALTH ACT OF 1990

THURSDAY, JUNE 28, 1990

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON SUPERFUND,
OCEAN, AND WATER PROTECTION,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:48 a.m. in room 406, Dirksen Senate Office Building, Hon. Frank R. Lautenberg (chairman of the subcommittee) presiding.

Present: Senators Lautenberg, Durenberger, Symms, and Chafee.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. The subcommittee is going to now consider, S. 2706, the Beaches Environmental Assessment, Closure, and Health Act of 1990. This bill would require EPA to set minimum standards to protect the public from contaminated coastal beaches. The basic goal of the Clean Water Act is to have swimmable waters. Just a few weeks ago the Environment Committee approved S. 1178, the Coastal Protection Act. This Act would mandate additional measures to clean up coastal waters.

But it is clear that standards and protocols are not now in place to assure our coastal beach waters are safe to swim in. According to OTA's 1987 report entitled "Waste in the Marine Environment," there has been an increase in the rate of outbreaks of waterborne diseases. OTA also concluded that sewage-impacted waters are responsible for relatively high rates of gastrointestinal illness in the United States.

Senator LAUTENBERG.

This morning, Mr. Allen Hershkowitz of the Natural Resources Defense Council will discuss NRDC's new report about beach closures. The report supports what we have been saying, that testing procedures and beach closing standards vary substantially from State to State. This means that a high bacteria level in one State would probably cause a beach closure, while in another State people would be allowed to swim in water despite equal health rates. There is reason to be concerned about those States which implement existing EPA guidelines. OTA concluded that EPA guidelines are inadequate to protect public health. The guidelines recommended assessing water quality for determining beach closures based on monthly averages of water samples. But these monthly

averages do not account for short-term violations of public health standards. As a result, beachgoers are not consistently assured that waters are safe to swim in. We need to establish standards to assure people that the waters they swim in won't make them sick. A day at the beach should not be followed by a visit to the doctor.

S. 2706 would require EPA to establish a minimum national standard and monitoring protocol to protect public health due to short-term pollution events. States would be required to adopt standards no less stringent than Federal standards. S. 2706 would provide people with the assurance they need that the waters they swim in are safe. In December of 1989, the National Association of Attorneys General adopted a resolution calling for minimum Federal testing standards and microbial standards.

[The resolution referred to follows:]

NATIONAL ASSOCIATION OF ATTORNEYS GENERAL

Adopted

Winter Meeting
December 10-13, 1989
Phoenix, Arizona

VI
RESOLUTION

TO ESTABLISH MINIMUM STANDARDS AND PROCEDURES FOR TESTING AND EVALUATING OCEAN WATER QUALITY

WHEREAS, it is the desire of all coastal states and all territories to promote a clean and healthy ocean environment for the protection of public health and the prevention of illness for the benefit of their citizens, tourists, and visitors; and

WHEREAS, despite this legitimate desire of coastal states and territories, the existence of significant bacterial contamination of ocean, coastal, and estuarine waters has been a growing concern to all states; and

WHEREAS, the United States Environmental Protection Agency's (EPA's) "Interim National Coastal and Marine Policy" establishes as one of its primary goals "the recovery of full recreational use of shores, beaches, and waters by reducing sources of bacterial and other contamination;" and

WHEREAS, the same EPA Coastal Policy advocates the objective of "determining the current health of the nation's coastal and marine waters;" and

WHEREAS, the most efficacious method of assessing the levels of microbial contamination of ocean waters, and the most effective means of determining the overall health of coastal waters, is through a comprehensive testing protocol to evaluate ocean water contamination levels and sources of pollution; and

WHEREAS, such a program of monitoring ocean waters should have minimum environmental standards applicable to all coastal states and should have appropriate methodologies for sampling and laboratory analysis; and

WHEREAS, the National Association of Attorneys General Ocean Pollution Subcommittee, in consultation with representatives of EPA and other State and Federal agencies, recognizes and advocates the need for a multistate protocol for testing water quality in all coastal areas.

NOW, THEREFORE BE IT RESOLVED THAT THE NATIONAL ASSOCIATION OF ATTORNEYS GENERAL:

1) Urges that the U.S. Environmental Protection Agency require a program establishing minimum testing standards to evaluate the degree of microbial contamination and overall water quality in all U.S. coastal and territorial waters;

2) Urges that the EPA establish minimum microbial standards that will determine the acceptability of all U.S. coastal and territorial waters for recreational and other primary contact activities;

3) Authorizes the Executive Director and General Counsel to transmit a copy of this resolution to the Administrator of the United States Environmental Protection Agency, each of the U.S. EPA Regional Administrators, the United States Attorney General, the National Governors' Association, interested members of Congress, and other associations and environmental organizations involved in these issues.

Senator LAUTENBERG. This morning I'm pleased to have a distinguished colleague, Congressman Hughes, from an area that includes much of the seacoast, the beautiful seacoast I might add, of the beautiful State of New Jersey.

Before I call on Congressman Hughes to testify on S. 2706, I would ask my colleague, Senator Durenberger, if he would like to make an opening statement.

Senator DURENBERGER. No, Mr. Chairman, I'll waive opening statement.

Senator LAUTENBERG. Thank you very much.

We have a statement from Senator Bradley which will be included in the record.

[The statement referred to follows:]

Testimony of Senator Bill Bradley
Submitted to
The Subcommittee on Superfund, Ocean and Water Protection
Of The Committee on Environment and Public Works
In Support of
The Beaches Environmental Assessment,
Closure and Health Act of 1990
June 28, 1990

Mr. Chairman, thank you for this opportunity to show my support for The Environmental Assessment, Closure, and Health Act of 1990. I am cosponsoring this legislation because it will reduce the chances that Americans are needlessly exposed to unsafe water at the beach. Americans face hazards enough at home and at work. We must do all we can to ensure that citizens are not exposed to unnecessary risks when on vacation as well. This legislation will help achieve that goal.

Vacationers at the beach, enjoying a few days off should not have to wonder whether the water in which they and their families are swimming could make them sick. They should know that the water is safe. This certainty can only come from a rigorous water quality testing program, and a willingness to tell the public when the water may be unsafe. This legislation would ensure that the water testing programs and beach closing rules nationwide are up to the task.

Every summer, I walk the beaches of New Jersey, and I talk to the people I meet about their concerns. New Jerseyans are worried about their beaches and worried about the safety of the waters in which they and their children

swim. Yet New Jersey's rules for testing coastal waters are more stringent than currently required by the EPA. When New Jersey's beaches are open, the water is safe. New Jersey has a comprehensive, effective water testing program. New Jersey does not flinch from its responsibilities to close beaches when, as sometimes happens, it may be unsafe to swim.

Some states are not so forthcoming. Some states do not test coastal waters well enough or frequently enough to ensure that residents and visitors are protected from disease. I am proud to say that New Jersey has gone to great lengths to ensure safety.

Mr. Chairman, I think of this legislation as, in part, a consumer information measure. As things now stand, each state runs its water testing program in a different way. Information on coastal water quality from the different testing programs can be difficult to make sense of or to compare, even for specialists. This legislation, and the companion measure introduced in the House by Representative Hughes, will ensure that testing programs in coastal areas nationwide are similar. National testing guidelines and national beach closure standards will make readily comparable information on water quality available to beach-goers. For the first time, Americans will be able to determine which beaches have real problems with dangerous pollution, and they will be able to compare beaches to determine which are the safest.

New Jersey beaches have nothing to fear from these comparisons. New Jersey has, I believe, one of the most effective water testing programs in the nation. New Jersey tests its water on a weekly basis. Many states test their water less frequently, or average the results of repeated tests, thus obscuring short term, intermittent or weather-dependent contamination. In New Jersey we find out about the short term pollution problems, and we take steps to protect people from possible health risks.

Mr. Chairman, some will complain that rigorous testing will do nothing to clean the water. I think that view is short sighted. To reduce the contamination of our coastal waters we must know the dimensions of the problem. Where are our beach waters unsafe? When do the unsafe conditions occur? Answers to those questions can be used, as they already have been in New Jersey, to track down pollution sources and eliminate them. Furthermore, these naysayers underestimate the power of publicity. If a beach is closed because of polluted water, or if people stop visiting the beach because of reports that the water is unsafe, efforts to find and eliminate the sources of pollution will redouble. And that is what this legislation is really about: cleaning our beaches, eliminating water pollution, and protecting Americans. The stringent testing and pollution guidelines that will result from the passage of this legislation will lead to real improvement in water quality at the beach.

Senator LAUTENBERG. Congressman Hughes is someone who has been in the forefront of efforts to clean up our beaches and our coastal waters. He has been a diligent supporter of equal standards applied to all States. Bill Hughes is someone who has developed a record for fighting for good things, including developing a rational approach to dealing with crime in our communities to dealing with matters of crime and violence. Again, he has a long record on making certain that our beaches are clean, that our waters are safe, and that we get on with the task of protecting the environment so that people can enjoy it, whether they are in New Jersey or in any other State.

I thank you for being here this morning, Congressman, and invite you to give your testimony.

STATEMENT OF HON. WILLIAM J. HUGHES, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. HUGHES. Thank you, Mr. Chairman. It really is a privilege for me to be here this morning at your invitation to testify before this most distinguished Subcommittee on Superfund, Ocean, and Water Protection in support of our bill, H.R. 4333, and the Senate companion bill, which fairly much tracks the House legislation, S. 2706.

I want to first of all say that I commend and congratulate and thank the distinguished Chairman of this subcommittee for your yeoman work in attempting to develop rational ocean policy. The distinguished Chairman, myself, and others worked just a couple of years ago on the ocean dumping legislation, legislation that would implement the international protocols to try to keep plastic and other debris out of the ocean, and a new strategic initiative to attempt to develop better planning in the coastal environment, where we expect some 40 percent of the population to exist early in the next century. I have no doubt but that the Chairman's most distinguished work will be recognized by future generations. I thank the gentleman for that work and that leadership. We are proud of the work that you do here in the Congress.

As you know, in our own State of New Jersey and across the Nation, bathing beaches serve as a major source of recreation and, in fact, represent a major part of the economy. In our State of New Jersey, tourism is our largest industry, a $7 billion-plus industry, much of which is hosted in my own beautiful area of New Jersey. People from all over the country come to the coast to swim, surf, boat, or just walk along the shore or to merely sit and enjoy the beauty of the sea. Our stock in trade are sandy beaches, clean water, clean air, and clean water. For coastal States, clean beaches and ocean waters really are the foundation for the tourist industry. Last summer beaches in New Jersey attracted 5.7 million vacationers who spent over $7.5 billion dollars.

Incidents of high concentrations of bacteria or viruses from excessive rainfall or sewage treatment plant malfunctions may happen anywhere, anytime along our Nation's coast. However, not all States provide the same protection from bacteria and viruses. There are some States, such as New Jersey, that have strict regulations for beach testing and monitoring and aggressive enforcement

of beach closures. I'm proud of the record of New Jersey because we think it is a public health interest. People have a right to know the quality of their water. In comparison, some States issue advisory warnings instead of closing their beaches, and others have no beach monitoring programs whatsoever.

I must concede that many of my merchants for many years thought that the best thing to do was try to keep it secret for fear that it would close down their operations in the summertime, and they were opposed to advisories letting people know the quality of the water. Fortunately, over the years, as the result of debate, we've arrived at the conclusion that people have a right to know.

EPA's current criteria is guidance to be used by the State in adopting standards. The problem that has led to much of the inconsistency among States is that EPA's criteria stops short of providing guidance on testing waters after short-term problems such as heavy rains or on closing beaches if the water quality exceeds that criteria. In addition, the Environmental Protection Agency does not issue guidance on beach closings and beach cleanups related to floatable debris.

The Beaches Act attempts to address these inadequacies by requiring uniform beach testing and monitoring along coastal and Great Lakes States. The legislation would also require a uniform protocol to close and reopen beaches. In addition, EPA would be required to issue guidance on beach closings and cleanups related to floatable debris.

The House Merchant Marine and Fisheries Subcommittee on Oceanography and Great Lakes has scheduled a markup of H.R. 4333, my initiative, the Beach Act for July 19 when we return from the Fourth of July district work period.

I'm very excited about the passage of this legislation, Mr. Chairman, and I look forward once again, Mr. Chairman, to working with you to see that this in enacted in the Congress and sent to the President this year.

I thank you.

Senator LAUTENBERG. Thank you very much, Congressman Hughes. I couldn't help but notice the reference you made to the time away from Washington as the district work period. I thank you for reminding the public out there.

Mr. HUGHES. Isn't that true, Mr. Chairman, we work just as hard back home in our districts?

Senator LAUTENBERG. I think it's true. Despite the fact that it is enjoyable to be back in your district, that doesn't mean that you are not busy and you are not doing things. The clamor to get away from here, sometimes referred to as the institution, is one that all of us share. It's nice to get back home and talk to the folks who share their problems openly and candidly with you. They sometimes tell you when they disagree with you. I occasionally get that.

Thanks very much, Bill, for being with us today. Obviously both our paths cross. The bill that you initiated over on the House side and the one that we've started here have a singular mission, and that is to make sure that the ocean is safe for recreational use, and also that what we want to do is have a clean breeding place for marine life and promote the development of fishing and marine industries. The ocean is there to be used sensibly, not to be abused.

And you and I have worked very hard on making sure that we get rid of the junk that people once casually threw into the ocean, including medical waste and, as you mentioned, sludge dumping. That is soon to be a thing of the past, and the sooner the better.

Senator Durenberger, you have a fair amount of water alongside your State, and though it is not salt water, at least we hope not, we invite you at this juncture to ask any questions.

Senator DURENBERGER. I would just compliment the both of you. One would get the impression when they see the New Jersey Congressmen and Senators working so hard on pollution areas that New Jersey is a dump. We know it's not, it's one of the greatest agricultural States in America, a place that many Minnesotans go to live and enjoy a great deal. But it also strikes me that either folks from New Jersey learn a lot from past mistakes or they send people to the Senate and Congress who care a great deal about these kinds of issues.

I'm complimented to be the ranking member of this subcommittee with a Chair who works this hard, not only to represent New Jersey interests, but to the extent that they impact on all of the rest of us in different ways. My only thought of the Chairman's comments about what we do to demonstrate that we work during home periods is that perhaps we ought to exchange States sometimes. If I went to New Jersey for the Fourth of July and did what you would normally do in New Jersey——

Senator LAUTENBERG. And I'd go to Minnesota in February. [Laughter.]

Senator DURENBERGER. Might not be a bad idea. At least it would demonstrate that while you are going to enjoy someone else's State, you are also going to get into his shoes and work for a while with his constituents.

Senator LAUTENBERG. A great idea. Especially as we discuss the interests or concerns of the subcommittee and committee, it's a very good idea. As it happens, Senator Durenberger comes from a State that I know moderately well, at least from the principal center because I used to do a lot of business there. But the whole State of Minnesota is just a beautiful place and people care about the State and community and they work hard and send good people to work here. And we've always enjoyed working with David Durenberger. He is a serious student of matters affecting our environment and is always there to be helpful when we have something that we are presenting either as a bill or to go through a hearing, as we are today, and be thoughtful about the questions asked.

Senator DURENBERGER. Can I ask the Congressman a question?

In drafting your legislation, was any thought given to the idea of establishing a water quality index, much like the air quality index broadcast on the news each night?

Mr. HUGHES. As a matter of fact, the legislation does just that. One of the problems we have is the EPA has not developed an acceptable standard. The standard we use today has been challenged; it's a relatively old standard. One of the requirements of the bill is to try to develop a standard that can be utilized around the country for beach closings. We use the fecal coliform standard which has been under attack for a number of years. Our State doesn't use

the fecal coliform as the single standard. We've developed another standard. But once again, we should have one standard. EPA, in consultation with other agencies and the scientific community, needs to develop a standard, criteria, index, whatever you want to call it, that——

Senator DURENBERGER. The question is premised on sort of "let the market work," and if you could come up with a correct index, put the index on television every day, and people would decide which beaches they are going to and which they are not, and the folks that were on the list every day that they couldn't get to would start cleaning up their beaches.

Mr. HUGHES. The gentleman is absolutely right. We found what happened, a lot of the States that had dirtier water than New Jersey were getting a lot of the tourists, and they were not advising people of the quality of their water. There is a great deal of competition, as I think the Senator knows, for tourists. One of the troubling features is that people were leaving beaches in New Jersey because there was some question about a beach closing, even where it was floatable, for instance, and the beach was opened up a few days later. But they would go to other beaches where the water was vastly dirtier.

Senator DURENBERGER. Thank you very much.

Senator LAUTENBERG. Our friend from Idaho, with a relatively small coastline.

Senator SYMMS. We have a lot around the lakes.

Senator LAUTENBERG. Idaho is also a beautiful State.

Senator SYMMS. Glad to have you over here, Congressman. Good to see you.

Senator LAUTENBERG. Thank you very much, Congressman.

Mr. HUGHES. Thank you, Mr. Chairman.

Senator LAUTENBERG. Now we will call on Dr. Allen Hershkowitz. I'm sorry. Doctor, you're known as a person with patience, so you will have to wait a little bit. We're going to call Mr. Wayland, who is the Deputy Assistant Administrator for Water from EPA to testify.

We have a process, Mr. Wayland, that we try to adhere to, and that is that we have a period of summary for your statement of five minutes, and then your full statement will be included in the record. With that, we invite you testify. Thank you for being here.

STATEMENT OF ROBERT WAYLAND III, DEPUTY ASSISTANT ADMINISTRATOR FOR WATER, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY WILLIAM R. DIAMOND, DIRECTOR, CRITERIA AND STANDARDS DIVISION, OFFICE OF WATER REGULATIONS AND STANDARDS

Mr. WAYLAND. Good morning, Mr. Chairman. I'm Robert Wayland, Deputy Assistant Administrator for the Office of Water, U.S. Environmental Protection Agency, and I'm accompanied by Bill Diamond of our staff. I appreciate the opportunity to discuss the recommendations set forth in S. 2706, the Beaches Environmental Assessment, Closure and Health Act of 1990. With your permission, I will summarize my prepared remarks and submit them for the record.

EPA shares the subcommittee's concerns about protecting and enhancing the quality of the Nation's coastal waters and beaches. However, we do not support enactment of S. 2706 because authorities to address these concerns already exist.

Over the past two decades, programs to control water pollution established by EPA and the States under the Clean Water Act have greatly reduced the threat of serious illness and disease from swimming at beaches. These programs include the construction of sewage treatment facilities and the controls on direct industrial dischargers. This is not to say that all human health concerns have been eliminated. EPA programs continue to focus on eliminating even the less serious, mostly short-term human health effects arising from remaining discharges and non-point sources.

In most States, the responsibilities for protecting beaches are often shared by State water quality agencies which set ambient water quality standards and enforce controls on sources of water pollution, and State public health agencies, which impose health advisories and swimming restrictions. These latter issues are appropriately left by the Clean Water Act to the States in their role as front line protectors of public health and safety.

The bill raises several issues in areas where EPA has activities currently underway. Under the Clean Water Act, EPA is assigned responsibility for developing water quality criteria guidance. State water quality agencies consider this guidance in adopting enforceable State water quality standards. To date, all States have adopted criteria for bacteria, which are used as surrogates for pathogens, and virtually all States have narrative prohibitions in their water quality standards that apply to floatables and debris.

In 1986, EPA issued a revision to its bacteriological Ambient Water Quality Standard based on new indicator bacteria, enterococci. Since then, five States have adopted these revised criteria. They are more precise, and work will continue with the remaining States to encourage the adoption of the revised criteria. Although the older State criteria based on fecal coliform bacteria are considered to be protective for swimming activities. EPA is currently considering additional research to identify new indicator organisms of human disease.

In the area of marine debris and floatables, these are ubiquitous and longstanding problems in our harbors and on U.S. beaches. Congress has passed legislation such as the Ring Carrier Act and the Shore Protection Act, while EPA has undertaken a multi-phase program to determine the sources and effects of floatables and establish appropriate control measures. The floatables program is being implemented as part of a cooperative effort with other Federal agencies, industry, and environmental organizations.

We are engaged in a number of projects to identify the types, quantities, and sources of marine debris. This includes a survey of 10 U.S. harbors to investigate the composition of debris. Data from national harbor surveys has revealed a correlation between certain debris items and the presence of combined sewer overflows. We have thus initiated a follow-up study of materials released from CSOs. The results of these studies will be used to determine the appropriate actions to be taken under the Clean Water Act.

I need to add that in August 1989, EPA published a national CSO strategy requiring States to submit CSO plans by January 1990, and I'm pleased that we have plans from New York and New Jersey.

We've also initiated the development of a guidance document for local beach authority use which gives guidelines for determining how to handle medical waste found on the beach and develop a central contact point to report medical waste washups.

We believe these actions and the activities of others make an important contribution to addressing the concerns reflected in S. 2706.

I would be pleased to answer any questions that the subcommittee may have, Mr. Chairman.

Senator LAUTENBERG. Thank you very much, Mr. Wayland. We have some questions for you. What I prefer to do is, if you wouldn't mind, either we'd invite you to continue to sit at the table or, if you choose, to move back to the audience. I want to call on Dr. Hershkowitz now because I want to be sure that we are discussing as many sides of the issue as we must to get an objective view of this legislation.

Mr. WAYLAND. I'll relinquish the witness chair to him.

Senator LAUTENBERG. Dr. Hershkowitz, we welcome you here. You've appeared before this committee before. We thank you for being available to us today and invite you to give your testimony. We'd like you to observe the five minute rule for your oral presentation. Your full statement will be included in the record. We invite you to give your testimony.

STATEMENT OF ALLEN HERSHKOWITZ, STAFF SCIENTIST, NATURAL RESOURCES DEFENSE COUNCIL, ACCOMPANIED BY DIANE M. CAMERON, ENVIRONMENTAL ENGINEER AND JENNIFER KASSALOW, SCIENCE ASSOCIATE

Mr. HERSHKOWITZ. Thank you, Senator. It's a pleasure to see you again. It's good to be here. I have with me my colleagues Diane Cameron and Jennifer Kassalow, who can support technically any additional questions you may have generated from my testimony. I'm here on behalf of the Natural Resources Defense Council which is a national environmental advocacy and research group with over 140,000 members around the country. NRDC has been a leading advocate and participant in the development of both national and local water quality programs. We appreciate the opportunity to testify before you today.

As you know, NRDC has for the past few months been reviewing data on beach closure practices for 10 coastal States that host some of America's greatest water resources. These States include California, Connecticut, Delaware, Florida, Maine, Maryland, Massachusetts, New Jersey, New York, and Rhode Island. We've also assessed the causes of beach closures as well as individual States' beach closure standards. What I would like to do is just briefly outline for you a summary of our findings.

In general we are here to offer support and commend your initiative to standardize baseline national criteria for beach closure practices. However, we would like to point out to you that standards by

themselves will not solve the problem of water contamination, which is the major culprit closing our beaches. Quite frankly, the world is heating up and we are losing our beaches. In 1989, there were more than 760 beach closures in the Northeast and the State of California, and 578 of these beach closures occurred in New York, New Jersey, and Connecticut alone.

A year ago, I appeared before your committee dealing with floatables in the water, and you asked will beaches close again this year, in 1989. At the time, I indicated that given certain assumptions about precipitation and proper functioning of sewage treatment facilities, we could expect as many as 80 to 100 beach closures last year. In fact, we saw five times that many beach closures in 1989 in the New York tri-State area, Connecticut and New Jersey.

High levels of bacteria in coastal waters are responsible for the overwhelming majority of beach closures in the United States, particularly on the North Atlantic coast and along the Long Island Sound. Among New York State beaches, Long Island Sound beaches, Long Island and Westchester County were the most frequently closed and contaminated. Long Island's southshore beaches, it's important to emphasize, experienced much fewer closures.

What we have found is that in fact no enforceable baseline Federal standards mandating uniform or minimum beach closure standards now exist. Indeed, current Federal EPA-recommended guidelines allow even "clean" beaches that meet levels considered safe to contaminate 19 out of every 1,000 swimmers with gastroenteritis, or 19,000 out of 1,000,000. Moreover, definitions of indicator organisms, testing protocols, and beach closure standards vary substantially from State to State. For example, as you indicated earlier, while a certain bacteria level would likely force a beach closure in New Jersey, which is the only State that mandates beach closures when the State bacterial standard is exceeded, a similar bacterial contamination in New York may not cause a beach closure. In the absence of validated epidemiological substantiation, the public is left with variable and unknown risks given the variations among States.

Of all the States' standards we reviewed, Maine tolerates the lowest concentration of any particular bacteria, while New York tolerates the highest concentration of any particular bacteria, and yet New York, given Long Island Sound conditions, reports the highest number of beach closures. However, New York should be commended because to expedite public health protection, it sometimes preemptively closes beaches following periods of high precipitation based on a modeling assumption as to bacterial contamination that will result. Nevertheless, New York, for example, uses a standard more lenient than the criteria recommended by the National Technical Advisory Committee more than twenty years ago, in 1968. In fact, within municipalities within Massachusetts, New York, and Maine, local health departments have different standards for beach closures. These inconsistencies make it difficult for State agencies and the public to keep organized and up-to-date records of beach closures. In fact, moreover, the guidelines of the World Health Organization are more stringent than those now rec-

ommended by the U.S. EPA, and have been adopted by many countries.

Inconsistent Federal and State water quality standards for pathogens in recreational waters, inadequate sewage conveyance and treatment facilities, the lack of mandatory beach closure provisions for beaches exceeding criteria, and inadequate public notification procedures combined present a potential risk to the public health.

Thank you.

Senator LAUTENBERG. Thank you very much, Dr. Hershkowitz. What I would like to do is to make sure, again, that the responses we are getting to questions are as balanced as we can make them.

Since there is a significant difference of view between EPA and the view of NRDC, in this case represented by Dr. Hershkowitz, what I would like to do is ask each of you questions that perhaps intersperse. Mr. Wayland, would you perhaps join us at the table and have your colleague join you as well? Give us a chance to review the commentary that each of you gave.

Mr. Wayland, you make the comment in your remarks that most serious human health effects from swimming in polluted waters have been eliminated. How is it that EPA claims the most serious health problems have been eliminated when the OTA Marine Pollution Report states that sewage-impacted waters are responsible for relatively high rates of gastrointestinal disease in the United States?

Mr. WAYLAND. I think the distinction we're making is between gastroenteritis, which all of us probably can testify is very unpleasant but by and large short term in duration and not life threatening, with other forms of disease that could be transmitted by the close proximity of people in waters impacted by sewage, like hepatitis, polio, diphtheria, other diseases which frankly we can't attribute to improved sewage treatment as much as to some other causes in society. But those are no longer sources of anxiety as people contemplate a trip to the beach as they once were.

Senator LAUTENBERG. Without getting into a detailed description of gastroenteritis, the fact is that beside a fair amount of discomfort, I think there is a potential for other things to ensue. I don't know whether you are an expert in the area, but is it not possible that there are long-term effects or at least long-term susceptibility to other conditions as a result of that? I'm hard pressed to figure out why it is that if we can eliminate a condition like gastroenteritis, that we shouldn't do it. Does your view confirm the fact that, okay, it's all right if you are sick for a day if you go to the beach; it's all right if your stomach is upset, disrupts your work routine or other things and gives you some discomfort? Is it that casual a thing, Mr. Wayland?

Mr. WAYLAND. No, I would not say that it's all right at all. However, I think there are practical limitations on our ability to eliminate altogether the possibility of disease outbreak. I think my statement simply tries to acknowledge that practical limitation rather than noting with any approval any of the distress. I'm not a medical doctor or a medical expert so I won't venture an opinion on the progression of bacterial-caused gastroenteritis to other conditions. We all know that in some circumstances, serious diarrhea

can lead to dehydration and that can be life-threatening, but I don't want to try to make a linkage that I'm not qualified to make.

Senator LAUTENBERG. Dr. Hershkowitz, you are not a physician either, but can you tell us what your organization's view, your view, is about the relative exposure to serious health problems? Again, you heard the discussion on gastroenteritis here. What comments to you have?

Mr. HERSHKOWITZ. A number of comments. First, I'm intrigued to learn of EPA's view that in fact contamination has diminished in coastal areas. In fact, in 1988, in New York State, there were 267 beach closures, and at that time in that year, many of those were associated with floatable debris washups. In 1989 in New York there were more than 450 beach closures, an increase of approximately 200 beach closures from one year to the next. Similarly, in Delaware there was one beach advisory in 1988, and yet there were 56 beach advisories in 1989. I believe that the data seems to suggest that at least for these two States we are seeing an increased concentration of bacterial contamination more widespread, more frequent, causing more beach closures.

With regards to the health risks, I think it is important to underscore that the bacterial indicators are in fact indicators for a wider variety of illnesses than just gastroenteritis. Gastroenteritis has been chosen by the EPA because it seems to offer the most basal correlation between particular indicators and a particular illness, but in fact it is only suggestive of gastroenteritis, and gastroenteritis, again, is only one among many types of illnesses.

The basic point, however, is that epidemiological substantiation for a direct correlation of risks between specific bacterial indicator concentrations and particular illnesses and specific target populations is simply not available. We cannot say with any degree of confidence that specific concentrations at particular times will expose this many people to specific kinds of illnesses. We don't have that, and in fact one of the intentions of your bill, which we applaud, is to undertake the kind of research necessary to validate that research.

I would like to ask my colleague, Diane Cameron, to see if she has any more to add on this.

Ms. CAMERON. Yes, one of the problems that Dr. Hershkowitz was referring to with the correlation with bacteria and illnesses is the problem that we are using proxy indicators like fecal coliform, total coliform, and enterococcus. These are proxies standing in for the real bad actors, the pathogenic viruses and other bacteria that are more difficult to analyze from water samples. This is just a basic problem that we have. It is just easier to sample and test for the proxies that are more benign than the bad actors that may be present, probably are present, in the water when we have a high proxy reading, when we get a high reading of total coliform and fecal coliform.

The work of Dr. Cabelli, who will be speaking here later, does show correlations between these proxy indicators and illness rates, although as Dr. Hershkowitz said, further study is needed. The guidelines of international bodies, including people such as the EEC, European Economic Community, do include guidelines not only for the proxies like fecal coliform, but also for more of the

direct bad actors themselves, like salmonella and like enterovirus or intestinal viruses themselves.

Again, I want to second the remarks of Dr. Hershkowitz that gastroenteritis is not a benign illness. Even if it's short term and temporary, it is not benign. Also, there are other illnesses such as dermatitis and even more serious staph infections and salmonella infections.

Senator LAUTENBERG. Mr. Wayland, just using the numbers as a reference, the number of beach closings one year versus the next, and the enormous increase in incidents of beach closure, I assume that no State is going to want to do that based on the economic results. It's got to be pretty serious before they declare a beach closed. It also affects a very significant social pattern, recreation; it means a lot to a lot of people. If you take the crowded areas that I come from, New York, New Jersey, a day at the beach is often the only form of recreation that's available because it is relatively low cost and accessible.

Don't these increased numbers give you cause for concern? You indicate that you think the problem is well in hand and that we ought not to pursue the goal of this legislation. What about the number of closings? They use a measurement that indicates unsatisfactory conditions in these waters.

Mr. WAYLAND. I believe a large number of the closings that Dr. Hershkowitz just referred to had to do with floatables, which I think—and that was the basis on which a number of those closures representing the increase occurred—which I think we all understand to be principally an aesthetic consideration rather than one driven by human health considerations. I think we also have improved test methods and States are acting based upon those test methods to take prompter action when they think there is a basis to believe that substantial waste is present in the waters.

My review of the New Jersey Blue Ribbon Report also refers to the fact that beach trips are increasing, beaches are becoming increasingly crowded and the proximity of a large number of people in a small water body can create the conditions that can prompt a closure. The New York example that was cited is another one where I think appropriately some States are taking action to preemptively close beaches based upon circumstances that would suggest that there could be high levels of bacteria present in the water, but where in fact those bacteria may not have been established.

I guess I would just like to back up in terms of views on the goals of the legislation. I think we certainly support a goal of trying to find mechanisms, make sure that beaches can be safely used. I think the structure of the Clean Water Act is such that our principal objective in establishing water quality criteria guidance for adoption by States as a water quality standards is to see that the sources of the contamination are dealt with, POTWs, non-point sources, CSOs, storm water, and so forth.

I think, frankly, had the objective been different from the beginning, there could be some concern that we were taking a "hats and sunglasses" approach to try to deal with water quality. In fact, our objective and that of the State regulators is to make sure that the contaminants are not introduced, the pollutants are not introduced

in the first instance, and that's been the basis on which we've operated and the basis on which our guidelines have been developed.

Senator LAUTENBERG. Are you suggesting that if you don't catch culprits before they commit the crime that you've done your best? Is there not some point which you ought to say the Clean Water Act sets given standards? It does have, doesn't it, swimmable waters as an objective?

Mr. WAYLAND. Yes, and the mechanism to realize that objective is to identify and control the polluters. By the same token, for example, we don't have authority under the Clean Water Act and we don't establish a fishing advisory in instances where there are short-term contaminations. Our objective is to find and deal with the polluter rather than to interdict the exposure. I think that is something more appropriately dealt with by public health agencies either at the Federal or State level. In many circumstances, there needs to be an understanding of the mechanisms that are causing that contamination and how long they will be present and how to advise people on their personal actions that can be protective.

Senator LAUTENBERG. So that if you have a good firehouse, and you have it properly staffed, you don't have to do an awful lot to put out the fire. If I draw the analogy, what you are saying is, okay, here are the rules; we've established them. Frankly, I find it hard to see the logic that says, okay, if under the Clean Water Act we should be treating all sewage; we know we're not doing that; we know that we don't have the dollars to do it; we know that the problem is almost overwhelming, we're chipping away at it. I mean, your agency is concerned with the public health in a way that almost no other agency is. You are involved with clean air, solid waste, you name it. It's hard for me to understand—if you are willing to establish clean air standards across the country, which, by the way, is affected by the activity of others within a given State; so it is often with water quality—why you would object, other than just to object, to having a uniform standard by which States measure? If a citizen of New Jersey goes to a beach in Maryland, I'm just as concerned about the quality of the water that person swims in, as I am for the Marylander who comes up to New Jersey to go swimming.

Mr. WAYLAND. If I could respond, I think that the Clean Water Act structure is fundamentally different from that of the Clean Air Act or the Food, Drug and Cosmetic Act in the sense that it articulates broad legislative goals—fishable, swimmable—then assigns to EPA the responsibility to develop criteria guidance by which States are to adopt standards to achieve that goal. That's a fundamentally different approach than in the other Federal statutes you described.

My experience in dealing with the Clean Water Act is relatively new, and I can't parse exactly the basis on which Congress made that distinction, but I'm simply observing that it exists, number one, and number two, that I think the Agency's focus has been and probably should remain on preventing the pollution, not having the firehouse and alarm bell, but keeping the oil-soaked rags out of people's basements, to use your analogy. I think we need to make sure that we have effective programs to deal with the pollution and

I think it is appropriate for local authorities and State officials to consider when people should be advised not to go in the water.

Senator LAUTENBERG. You shouldn't have done it. It's not your fault.

Mr. WAYLAND. We would inspect and prevent those oil-soaked rags from being stored there in the first place.

Senator LAUTENBERG. The gastroenteritis condition, is that one that's included in the definition of swimmable waters?

Mr. WAYLAND. Yes, we have adopted water quality criteria for protection against water-borne disease by bacterial transmission and, as you have heard, the indicators of that are proxy in measurable bacteria.

Senator LAUTENBERG. You use 1986 criteria. They are based on a risk factor that allows 19 illnesses out of 1,000 swimmers. Am I correct in that?

Mr. WAYLAND. In 1986, when we revised our earlier criteria based upon epidemiological evidence for the first time really associated disease with the presence of an indicator, we adopted a level that corresponded to the previously existing level, the basis for which, I think, was a general recognition by professionals in the field that it was a protective level.

Senator LAUTENBERG. So you say that 19 illnesses out of 1,000 swimmers is a reasonably accepted result?

Mr. WAYLAND. The recommendation is at a level that corresponds, we believe, and the correlation isn't perfect, to a disease rate at that level although, once again, the mechanism is one in which we presented information that allows States to adopt a standard which is more or potentially less stringent than that.

Senator LAUTENBERG. But you are saying that as far as the Federal Government is concerned, if five million people visited New Jersey's beaches, as was suggested by Congressman Hughes, to have a couple hundred thousand of them get sick for a day or what have you, that is an acceptable standard as far as you are concerned. You are saying let the States worry about that and EPA is content to have that as the least level of difficulty that one should be exposed to.

Mr. WAYLAND. If, on a sustained basis, water quality exceeded a standard based upon that criteria, I think we would believe it would be extremely important for the State to deal with the pollution sources giving rise to that contamination.

Senator LAUTENBERG. So that if New Jersey's beaches are contaminated by sewage coming out of New York as a result of combined sewage overflow and it doesn't take a lot to raise the level of flow to the point at which raw sewage is discharged, you say well, that's between New York and New Jersey?

Mr. WAYLAND. We are actively working with New York, New Jersey, and the other 57 States and territories to assure that effective CSO programs are adopted.

Senator LAUTENBERG. But, again, you are saying let New Jersey worry about how it wants to apply a standard, even though its water is affected by activities of other States. We've got the Clean Water Act in place, and sure, it's a couple of dozen years behind schedule in terms of its treatment facilities, but if New Jersey wants to be more careful than, to use the example again, New

York, people ought to know that on their own, and as far as EPA is concerned, we needn't interfere there. That's the message I hear you giving.

Mr. WAYLAND. I think the existing test methods and criteria are far from perfect for predicting when a beach should or should not be closed. The best test method we have, and it is an improved one, really requires a day for analysis of results. And in the day between the time the sample is taken and the results are available, many things can happen with respect to currents and discharges, and it requires some judgment about those circumstances to understand whether or not there is a continuing contamination problem.

Senator LAUTENBERG. Dr. Hershkowitz, how do the public health risks associated with EPA's criteria compare to those of other nations or the World Health Organization?

Mr. HERSHKOWITZ. I'm going to defer to my colleague, Ms. Cameron, on that issue.

Ms. CAMERON. Of course the guidelines and criteria of other countries vary widely. I would point to a few international bodies or other countries that do have more stringent guidelines. Like I mentioned, the EEC has a directive that includes a guideline, which is not mandatory, which is twice as stringent as what is typically used by the States. The 200 fecal coliform standard, 200 counts per 100 milliliters, is very commonly found among the States. That is equivalent to the health risk that is recommended by EPA as the acceptable health risk, the 19 per thousand. So the EEC is recommending to its member countries that they adopt a standard that is twice as stringent as that recommended by EPA. Now the EEC also has another standard which is the mandatory one, that is the absolute ceiling beyond which its member countries cannot go, and that ceiling is a bit higher. It is 2,000, or 10 times the EPA recommended number. So that is the absolute ceiling, but they recommend 100 counts or twice as stringent as EPA.

Mr. HERSHKOWITZ. I would just like to add briefly, just for the record, that in fact the number of beach closures that resulted in 1989 as a result of floatables as opposed to bacteria decreased from 1988 to 1989, which is why we began our testimony indicating that bacterial concentrations are in fact the overwhelming cause of beach closures. Although 1989 saw thirty-one people injured by syringes in the Northeast, seven of them being children, in fact those beaches were not closed. Whereas in 1988, when we first started to encounter medical debris washing up, we did close beaches for the presence of syringes, especially when people were injured. I would also point out that while we agree with the EPA's objective of pollution prevention and minimization at source, it's important to point out that unless we have enforceable standards, you're not providing the kind of incentive necessary to enforce that pollution prevention, which is another argument in favor of some kind of minimum Federal baseline standard.

Finally, I would just remark that we have a history with the evolution of other regulatory statutes in the area of environmental protection, Clean Air Act, RCRA, other statutes where we have initially tried to use State-by-State incentives, Federal guidelines allowing States to operate with their own standards in place, but we have consistently, depending on statute, moved away from that,

seeing competition for the siting of industrial facilities, seeing regulatory wars so to speak, seeing situations where one State has lesser waste management requirements in the case of RCRA than another State, which allows it to be taken advantage of by other States. So the inconsistencies open up a plethora of problems with regards to competition for jobs, tourists, industries, so on and so forth, not to mention public health variations.

Senator LAUTENBERG. Mr. Wayland, you talk about the efforts you are making to protect people from pathogens, floatables. Don't you think EPA ought to have minimum criteria for determining when beaches are safe for swimming?

Mr. WAYLAND. The criteria that we have adopted, we adopted in 1986, is the basis for State standards, and in the absence of a State-adopted standard, or a standard that EPA found to be unacceptable, would at this point most likely be the level that EPA would promulgate on behalf of the State that failed to adopt a standard or adopted a standard determined by EPA to be not protective of public health.

Senator LAUTENBERG. How different might conditions be between contiguous States, counties, municipalities, within a given State? Can there be wide variations in conditions?

Mr. WAYLAND. There can be wide variations in conditions due to natural factors, due to legislative policy-making, due to population density.

Senator LAUTENBERG. Any number of things you mentioned earlier. Again, I've got to tell you I find it difficult to comprehend why it is EPA is so resistent on having some kind of uniformity for determining when beaches are safe for swimming.

Dr. Hershkowitz, in your opinion are differences in local conditions so large that we can't have a minimum Federal standard?

Mr. HERSHKOWITZ. When you look at enterococci as an indicator organism, the standard being used in Maine is one-sixth the number being used by Delaware. That is, Delaware tolerates a concentration six times that of Maine. Connecticut tolerates a concentration more than three times that allowed in Maine, using the same indicator organism. Again, in the absence of validated consensus with regards to epidemiological relationships between specific bacterial concentrations and specific illnesses of target populations, I think it is incumbent on EPA to somehow standardize and undertake the necessary investigations to standardize the health risks among the States. New York uses entirely different terminology, for example, than does Maine with regard to indicator organisms, testing procedures, and concentration standards. Consequently, the public is at a loss to know whether or not a beach kept open in New York is or is not cleaner than one that has been closed in New Jersey or in Maine.

Senator LAUTENBERG. Mr. Wayland, we talked a bit about the short-term events and their consequences. EPA's current ambient water quality criteria recommend using test averages to assess medium- to long-term beach water quality. What about those short-term pollution events? Do your criteria protect people from short-term pollution problems?

Mr. WAYLAND. They were derived with the objective of identifying water bodies impaired over a significant period of time so that

the pollution sources could then be the subject of more stringent controls. The test methods are useful, I think, for local authorities in making determinations about whether or not there is a correlation between the presence of elevated bacteria levels and storm events that would prompt CSO problems or other circumstances they could use as a predictive tool to determine whether or not a beach closure should occur.

Senator LAUTENBERG. Does EPA provide any guidance on when to close or when to reopen a beach based on the short-term pollution event?

Mr. WAYLAND. No, Senator, we do not.

Senator LAUTENBERG. Are you confident that State standards and monitoring procedures are adequately protecting public health from short-term pollution events?

Mr. WAYLAND. I probably couldn't make that general statement because I have to say I am not familiar with the mechanisms by which State health departments, together with State water pollution control agencies, act on information on a short-term basis.

Senator LAUTENBERG. Dr. Hershkowitz, what do you think? Are State and local testing and monitoring programs adequately protecting people from short-term pollution exposure?

Mr. HERSHKOWITZ. It is important to point out that States such as Maine, Massachusetts, and New York, in fact, have variations within the States themselves with regard to local health departments' testing protocols, bacterial concentration standards, and closing procedures. That is, Nassau County has a different procedure than Suffolk County, Westchester has a distinct procedure from the two of those. A similar situation exists in Maine; a similar situation exists in Massachusetts. It is to us of even greater concern that you can go from Nassau to Suffolk and be subject to varying beach closure standards or procedures. Do you want to comment on that?

Ms. CAMERON. With regard to proper procedures for testing beaches, it is especially important to remember what is the source of contamination. If the source is storm water related, like a combined sewer overflow, then it is especially important that the local county testing people come out after a storm, or immediately after a storm, and they link their testing with storm events because that's when the high bacterial and pathogen counts will occur and that's when people are at the highest risk. However, except for New York, which does have a storm water or rainfall-related model that is sometimes employed for closing beaches, we are not aware of other States and other places that link their testing and beach closing procedures to storm events. If they have a CSO beach, they need to test immediately following a storm event so that they can protect the public if that beach is exceeding criteria.

Senator LAUTENBERG. Thank you all very much. The testimony has been very helpful. Thanks, Mr. Wayland, Dr. Hershkowitz, and your colleagues.

Now I would like to call the next panel, Dr. Cabelli, Mr. Neafsey and Mr. Svenson.

Dr. Cabelli, we welcome you to the witness table at this point. Thank you for being here with us this morning. Again, I would ask you to kindly give your testimony in not more than five minutes

and your full statement will be included in the record. I would appreciate it if each of you identifies yourself. Obviously, we know where you come from, you come from three different great States, but Mr. Neafsey comes from an especially great State.

Our States have a lot in common in terms of our beach interests, in terms of sharing of the recreational activities that prevail in our States. In New York, the extensive beaches, the salt water beaches, the fresh water beaches up in the northern part of the States are beautiful areas. I often think about the number of miles of beach in New Jersey compared to mainland areas in our States, and we have to rank among the highest. Of course, it leaves Alaska out and maybe Florida with lots of islands, but we have a lot of beach front.

Rhode Island, Dr. Cabelli, is a tiny State with a very beautiful coast on the south, and up the James River and a few other places. We are pleased to have you.

I'd ask you all to testify in the following order: Dr. Cabelli, Mr. Neafsey, and Mr. Svenson. I've done the biographical so unless you have something to add, please go ahead and testify under the five minute rule.

STATEMENT OF VICTOR CABELLI, PROFESSOR OF MICROBIOLOGY, UNIVERSITY OF RHODE ISLAND

Mr. CABELLI. Thank you, Mr. Chairman. I will limit my comments to illnesses which are swimming-associated and related to the contamination of the water with fecal wastes such as those from municipal wastewater discharges, combined sewer overflows, and storm water runoff.

As seen from the results of the prospective epidemiological studies conducted at marine and fresh water beaches by the USEPA in the 1970s and early 1980s, and subsequent ones conducted in several countries since that time, there clearly was a risk of illness associated with swimming at beaches which at that time were acceptable for swimming according to local standards. Fortunately, the most prevalent illness by far was a relatively benign gastroenteritis with a short incubation period, relatively mild symptoms consisting of nausea, abdominal complaints, diarrhea, and occasionally vomiting and fever, a short duration of two to three days and no long-term effects. Clearly, there is an acceptable risk for this illness which, incidentally, is spread by a number of other transmission routes.

More serious enteric disease, such as typhoid fever, infectious hepatitis, were observed in only one study, the one conducted in Alexandria, Egypt, beaches. Four cases of typhoid fever reported among swimmers at beaches which were grossly contaminated with raw sewage; they were even aesthetically unacceptable except to the local population.

The output from the U.S. studies at marine beaches was a mathematically expressible relationship between the rate of swimming-associated acute gastroenteritis, which is the most prevalent swimming-associated, pollution-related illness, and the geometric mean enterococcus levels in the water, which is the indicator whose levels in the water were the best correlated to the gastroenteritis

rates. I refer to this as a criterion. Thus, once a decision is made as to the rate or risk which is acceptable, a limit, in effect a standard, can be extrapolated from the criterion. Since there are economic and sociologic inputs to acceptable risk, I do not believe marine recreational water quality standards should or can be set at the national level.

However, the USEPA in 1986 did provide the States with the criterion and numerical guidelines. Those for marine waters accept an acute gastroenteritis rate of about 19 cases per 1,000 swimmers. It is my understanding that since this is a somewhat relaxed guideline, the USEPA has urged the States to enact more restrictive standards. And most of those States which have enacted standards to this date have enacted more restrictive ones.

As seen from the epidemiologic studies conducted in the U.S. and in certain other countries, enterococci are the best indicator of the risk of swimming-associated, sewage pollution-related illness. However, the enterococcus as well as the coliform indicator systems have two deficiencies. The first is that they do not survive wastewater chlorination as well as the Norwalk gastroenteritis virus. The second is they are found in the fecal wastes of lower animals. By inference and from recent epidemiological data, contamination of the water with human fecal waste carries with it a much greater risk of illness than that from the waste of lower animals. Both these issues require more research, although some is underway. We need additional indicator systems which can, when necessary, be used to modify judgments made from the enterococcus data and additional epidemiological data to guide us in doing so. I would hope that this can be accomplished with an additional expenditure of no more than $1–$1.5 million per year over the next three years.

Finally, I believe that because of the number of local variables, compliance monitoring programs, including those directed at so-called short-term effects, should be designed at the local level against local and/or State standards. I believe that, at the Federal level, the existing marine recreational water quality criteria and guidelines are adequate for at least the next three years. Thus I cannot subscribe to the provisions of section 3 of S. 2706. I do, however, thoroughly endorse sections 4 and 5.

Senator LAUTENBERG. Thank you, Dr. Cabelli.

Mr. Neafsey is next, and we welcome you here from Trenton and invite you to give your testimony.

STATEMENT OF EDWARD NEAFSEY, SPECIAL ASSISTANT TO THE COMMISSIONER, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Mr. NEAFSEY. Good morning, and thank you, Mr. Chairman, for affording the New Jersey Department of Environmental Protection an opportunity to comment upon what we view as a critically important piece of legislation. On behalf of the Department, I would like to thank you, Mr. Chairman, and also Senator Bradley for both of your leadership roles in sponsoring this bill and for your unceasing work to better the quality of life that we experience in

New Jersey. Similarly, I would like to thank Congressman Hughes for his efforts on the companion bill.

Mr. Chairman, the Department wholeheartedly supports this legislation and applauds your work to develop uniform, minimum water quality criteria and testing procedures which will regulate coastal bathing waters and beach closure protocols across the country. We in New Jersey believe that we have the Nation's strictest water quality monitoring program. During the summer season, 330 separate sites along New Jersey's 127 miles of coastline are sampled and tested on a weekly basis. A handout was distributed to the subcommittee. It is called the "Cooperative Coastal Monitoring Program" and we provide this information to the public on an annual basis. By strictly adhering to the monitoring program, we try to ensure that our beaches are safe and healthy for swimmers and for bathers. The program allows us to detect problems as they develop so that sources of contamination can be quickly identified, the public immediately warned, the beach closed if necessary, and a solution to the problem put into effect as soon as possible.

That New Jersey's Coastal Cooperative Monitoring Program is a success became evident based upon the interim results of the New Jersey Department of Health study which indicated that there was no increase in illness associated with ocean bathing in New Jersey waters. And I might add that the final report based upon that study has not yet been issued.

However, Mr. Chairman, there is a cruel irony which accompanies the stringency of our program. By working hard to ensure protection of the public health, New Jersey may be actually tarnishing its image for having clean, safe beaches, and that's because the public's perception of water quality is related to beach closures. And those States which rely upon less stringent standards, less frequent testing or averaged readings, have an unfair advantage over those States which do more to protect the public. That shouldn't happen, and that won't happen if this bill becomes law.

And if I can just briefly address some other provisions in the bill, our Department has had a lot of experience with floatables. We conducted a floatable study in conjunction with USEPA. The study indicated that floatables present a problem which ignores State borders and State boundaries. The scope and magnitude of the problem is dependent on the vagaries of rain, wind, and tide. Therefore, we believe the best way to handle the floatables issue is to control them at their source.

In New Jersey, we use the nationally accepted criteria for fecal coliform. This indicator, as well as enterococci, are not human-specific, and since neither indicator is representative of viral pathogens, New Jersey has funded research to develop a viral human-specific indicator for pathogenicity in coastal waters. There is a need for this research to continue and we are pleased that this bill will require USEPA to conduct a study which will add to the base of knowledge on this topic.

In closing, Mr. Chairman, the DEP feels that by setting national criteria for testing and closure you will help the public better understand water pollution-related events and build public confidence in ocean water quality. Again, in New Jersey we believe we are doing all that we can to protect the health of bathers and swim-

mers, and the Department strongly supports this bill because it will accomplish the same thing on the national level.

Thank you.

Senator LAUTENBERG. Thank you very much, Mr. Neafsey.

Now we ask Mr. Svenson to comment.

[A letter from Mr. Neafsey follows:]

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUDITH A. YASKIN, COMMISSIONER
CN 402
TRENTON, N.J. 08625-0402
(609) 292-2885
Fax: (609) 984-3962

July 6, 1990

The Honorable Frank R. Lautenberg, Chairman
Senate Subcommittee on Superfund,
Ocean and Water Protection
United States Senate
Washington D.C., 20510-3002

Dear Senator Lautenberg:

Thank you again for allowing the New Jersey Department of Environmental Protection an opportunity to comment upon S.2706, the Beaches Environmental Assessment, Closure and Health Act of 1990. The Department considers this to be a critically important bill and commends both you and Senator Bradley for your sponsorship of this needed legislation.

I would also like to reiterate a few points which were made at the hearing on behalf of the Department. We believe that New Jersey's Cooperative Coastal Monitoring Program is the most comprehensive coastal water monitoring program in the nation. The success of this program is the result of New Jersey's intense commitment to provide safe and healthy beaches for all swimmers and bathers who visit the Jersey shore.

New Jersey not only tests coastal water quality on a weekly basis, but also mandates closure if its stringent standards are exceeded. As pointed out in the National Resources Defense Council report which was issued at your hearing, New Jersey is the only state in the nation which couples these two protocols.

Additionally, the New Jersey DEP routinely conducts enforcement compliance inspections of coastal wastewater treatment facilities. Finally, helicopter surveillance of the entire coastline and potential sources of floatables and contamination in near shore waters is conducted on a daily basis during the summer season. While no one component of the program standing alone may be enough to insure protection of the public health, together these ingredients allow New Jersey to react quickly and definitively to minimize public exposure to transient episodes of contamination. Thus, a hidden strength of the Cooperative Coastal Monitoring Program is its ability to assess and remediate contaminant input to coastal waters.

While answering questions posed by the Chair, Dr. Cabelli stated that Delaware has the best coastal monitoring program in the nation. It is important to note that Delaware relies upon the enterococci standard. Because of the historical data base which exists regarding fecal coliform, New Jersey relies on that standard. The distinction between the two standards may not prove to be significant because all experts seem to agree that a better pathogen indicator should be utilized. I should add parenthetically that section 5 of your bill recognizes this shortcoming and calls for additional research to identiry more reliable indicators of human-specific pathogens in coastal waters.

A more crucial distinction between New Jersey's program and Delaware's is that our State mandates closure upon an exceedance while Delaware, when confronting the same situation, will merely issue a health risk advisory. Therefore, in Delaware a beach may or may not close when a health risk exists in coastal waters. Contrarily, closure of a New Jersey beach is required if the standard is exceeded and the beach will remain closed until safe water quality levels are achieved.

As I testified before you, it is ironic that New Jersey has a bad reputation for coastal water quality. That undeserved reputation is directly attributable to our stringent water quality monitoring program under which the public health of bathers and swimmers is safeguarded. The importance of your legislation lies in the fact that it will insure safe and healthy coastal waters on a national level.

Very truly yours,

Edward M. Neafsey

Edward M. Neafsey
Special Assistant to
the Commissioner

STATEMENT OF RICHARD SVENSON, DIRECTOR, BUREAU OF COMMUNITY SANITATION AND FOOD PROTECTION, NEW YORK STATE DEPARTMENT OF HEALTH

Mr. SVENSON. Thank you, Mr. Chairman. Good morning. I'm Richard Svenson. I'm the Director of the Bureau of Community Sanitation and Food Protection for the New York State Health Department. I would like to thank you for the opportunity to testify on S.2706.

In New York State, the protection of water quality and public health at bathing beaches is a shared responsibility. The New York State Department of Environmental Conservation is responsible for the classification of waters for their best usage and the establishment of water quality criteria to protect that usage, while the New York State Health Department is responsible for administration and enforcement of regulations promulgated by the State's Public Health Council regarding adequate bather supervision and water quality. The County and City Health Departments are the State's guardians of the coastal and Great Lake public bathing areas and have routinely monitored bathing water quality for the opening and closure of public bathing beaches.

In the New York metropolitan area, Suffolk, Nassau, and Westchester County and the New York City Health Departments have spent significant resources over many years in developing comprehensive sampling programs and water quality models. Sanitary surveys coupled with the existing knowledge of the location of discharges from storm and sanitary sewers and sewage treatment facilities, tidal and scouring effects, rainfall impact, have been used to determine the need to close and open beaches.

New York has a long history in the use of water quality criteria to protect the public health and safety of its citizens. Bathing waters have water quality standards specified in regulation by which it is determined if a particular water can be appropriately designated for bathing use. The principal criteria which have been used are total and fecal coliform indicators. Our regulatory programs are predicated upon meeting these criteria. In coastal areas, this has resulted in a massive construction program of treatment plants to treat municipal waste.

However, the job is not done. We still must address the significant threat to bathing waters caused by combined sewer overflows and storm water runoff. Communities in New York have embarked on massive programs to address the concern. New York City, in fact, has committed to a multi-billion dollar program to address water quality problems caused by the combined sewer overflows and the States await the promulgation of Federal storm water regulations to add to the quiver of regulatory authority that can be used to help protect the public health.

As I indicated, for the day-to-day decisions on beach closures New York relies on a long-established program of sanitary surveys which includes bathing criteria and monitoring protocols. In recent years this has been augmented by additional guidance to address the concerns related to floatable debris that was such a significant factor in beach closures in the summer of 1988 in the New York City metropolitan area. In fact, the medical waste concern was

carefully reviewed with the involved city and county health departments and State agencies. Part of the problem is the need to educate the public and the beach operators. In response to that, two brochures were produced and distributed early last year and are submitted to the subcommittee for its review.

The beach closure decisions are made by local public health officials who rely on monitoring information and knowledge of local conditions to make the important decision on when to close a beach and when to reopen it after a pollution incident. Some beaches in New York City have been closed for an entire bathing season because it is known that water quality criteria cannot be met. Other more difficult decisions of intermittent closures must be made routinely by these officials. A list of the 1988 and 1989 closures is being submitted also to the subcommittee.

The New York State Department of Health compiles statistics on reported incidence of related illnesses at bathing beaches. The record is a good one. Reports of water related incidents of illness are few, and no epidemics at coastal beaches have been recorded in the last 10 years or more.

Current debate has focused on indicators, most specifically bacteriological indicators, used for closure of beaches. The Department of Health has for some time used total coliform. In 1988, we allowed the option of fecal coliform. In 1984, we did take a look at the Federal EPA proposals for E-coli and enterococci. We concluded that although these two tests are better indicators for pathogens, the linear correlation of these water quality parameters to GI illness is inadequate to utilize such numbers for regulatory purposes. In fact, information regarding sampling frequency, tidal and rainfall effects, and sanitary surveys must be combined for comprehensive bathing beach surveillance. In commenting on that proposal, we had urged EPA to consider more research to get better numbers.

In addition to the bacteriological, the New York State Sanitary Code contains language that requires beach closure restrictions when chemical, physical and biological quality, including chemical discharge, deposits, etc., in the water create a health or safety hazard.

It is with these facts that I offer the following comments regarding the proposed legislation.

The existing standards and guidelines used in New York have been effective. They have been accepted and used by public health professionals at the local levels to make decisions regarding beach closures. In fact, we have not had any documented disease outbreaks due to the New York beaches in the last 10 years. New York State utilizes multiple criteria in its regulation of bathing beaches. The proposed legislation also requires multiple criteria regarding the monitoring of marine and recreational waters nationwide.

We are pleased that the bill clearly indicates that the States are to be consulted by EPA in its review and development of proposed standards and will be given the option of adopting their own standards as long as they meet a uniform set of criteria or objectives. If the State fails to adopt a water quality standard, we recommend that the existing provisions of the Clean Water Act be followed,

which require EPA to promulgate such standards for the States so that the standards are not enacted by default.

We fully support the priority given to further research and study to identify indicators in human-specific pathogens in marine recreational waters. We previously asked that EPA do more work in this area so that a firm foundation could be established if indicator numbers are to be used for regulatory purposes. The development of environmental quality criteria that will establish guidelines for pathogens and floatables will be helpful.

We recognize the issue of uniform criteria is a concern that must be addressed. It is with this in mind that we support the work of the State of New Jersey, the National Estuary Program, and the New York Bight Restoration Program to develop better specific indicators that can more closely approximate the survival of viruses in the marine environment. We also acknowledge the problem with current indicators and look forward to the completion of the New Jersey Alternative Indicator Study and the National Indicator Study, which is targeted to shellfish safety.

In summary, New York State believes the proposed bill provides for a workable regulatory framework. We urge that the scientific and public health community be given every opportunity to review the protocols and findings of EPA's research in order to reach a consensus on the regulatory criterion.

I thank you, Mr. Chairman, for the opportunity to comment and I will be pleased to answer any questions.

Senator LAUTENBERG. Thank you very much.

Mr. Svenson, a question, please. You testified in front of the House Subcommittee on Oceanography and the Great Lakes that New York State opposed Congressman Hughes' companion legislation. What caused you to decide on S. 2706? You opposed the Hughes bill. Why are you supporting our bill? What's the distinction?

Mr. SVENSON. A couple of things. This is a better bill.

Senator LAUTENBERG. Why? I knew that, but I want to know why you think so.

Mr. SVENSON. New York could live with it, even though we feel that we have things in place to address the beach concerns. First of all, it amends the Clean Water Act, not the Coastal Zone Management Act. It recognizes marine recreational waters as opposed to just looking at coastal zone management areas. It recognizes multiple criteria; the other bill seemed to be focused more on just one indicator. From a program of working with the States, it had more of, I felt, the flavor that you were going to work with the States.

The other was establishing a council, which we felt was unnecessary. Before we felt the bill was redundant. It created another council, the Hughes bill, another council and came up with another arena, whereas we felt that the Clean Water Act was the arena to deal with this. So if your bill is telling EPA they have to give a priority to this area, and that is something we told them, we can be supportive of all of that.

Senator LAUTENBERG. Thank you very much.

Dr. Cabelli, in the introduction earlier I noted that your colleagues at the table represented particular States' interests, and though you are at the University up there, I assume that you are

not just concerned—neither are they, of course—but you are less just concerned about a Rhode Island problem?

Mr. CABELLI. I am most assuredly not speaking on or for Rhode Island.

Senator LAUTENBERG. So I wanted to be fair to you to make sure that was clearly understood.

You said that testing for pathogenicity to determine beach closures due to short-term events would have to be done daily to be truly effective. Why couldn't a State or locality test once a week and then immediately after a suspected pollution event to determine whether or not what the quality of water is?

Mr. CABELLI. For the very reason you stated. If one collects samples once a week towards determining compliance, no information is available for the other six days.

Senator LAUTENBERG. That's the extreme, of course.

Mr. CABELLI. Beyond that, by the time one has the microbiological data that indicate the beach should be closed, the indicator levels frequently have returned to normal. In effect, the barn door is closed after the horses have escaped, and what is perceived to be a horse may not actually be one.

Many regulatory agencies close beaches based on those events which their previous experience has shown will lead to unacceptably increased indicator levels, usually rainfall. Milwaukee started to do so many years ago. The Shellfish Sanitation Program also allows rainfall-based conditionally-approved growing areas. This makes a lot of sense but depends on an experience factor which can't be obtained or defined at a national level; that is, it properly is a local function managed by knowledgeable people at the local level.

Senator LAUTENBERG. Even at seven days, at the extremes every seventh day, there would be some exposure for a short period of time. It would seem to me that we're better off to at least know that you establish a database for future reference. There are all kinds of reasons, I think, to get in there and test as opposed to saying, if we want to use your analogy, "Okay, the horse is going to get stolen anyway, why put a door on the barn?"

I think that in order to protect the public health at the maximum level possible, our bill addresses the concerns that people have about different yardsticks for measurement about different exposures.

You said that you didn't object to section 4 or 5 in our bill. Section 4 requires States to adopt standards based on the Federal minimum criteria. Is that what you are saying, just to be sure.

Mr. CABELLI. Yes, if one defines criteria as I did in my prepared statement. The criteria are available. Beyond that, I would point out again that closing and opening beaches should be a local function since it is dependent upon a variety of local conditions, eg., meteorological, hydrographic. They are virtually impossible to spell out at a Federal level.

If I may make one other comment as regards restrictive standards. To the best of my knowledge, Delaware now has the most restrictive marine recreational water quality standards of the States from New York to Maryland. I think that the major problem in New Jersey is storm water runoff as it affects the quality of beach-

es. Moreover, it seems to me that, at times, the regulatory authorities unnecessarily "close" beaches because one or two values exceed a limit meant to be used as a geometric mean.

Senator LAUTENBERG. A distinguished colleague has arrived who is interested in the environment. He is Senator Chafee, who is a long time environmentalist in terms of his concerns about a clean environment and ocean and sound waters and we've discussed these things many times.

New Jersey, with its process of closing beaches when they believe that the criteria are met, which raises some risk, are pretty aggressive about it, and New Jersey is willing to meet a national standard and apply the same level. Perhaps if the Delaware criteria is stricter, maybe that evolves as the national standard. But New Jersey, for its diligence, certainly ought to be meeting the standards on some kind of a uniform basis. We're willing to do whatever one must do to assure that the public health is protected.

In your testimony you said something that I thought was fairly interesting and that is, I thought frankly, kind of a casual dismissal of gastrointestinal illness. The OTA assessment of 1987 reported that States' sewage-impacted waters are responsible for relatively high rates of gastrointestinal illness in the U.S. Now, you said in your testimony that, and let me not speak for you, there is something in the neighborhood of two to three days of maximum effect. Isn't this something we ought to be concerned about altogether? You mentioned that gastroenteritis is a benign illness. I don't know whether those who are subjected to it feel that it is so benign, but I would like your comments on that.

Senator CHAFEE. Mr. Chairman, could I interrupt for just one moment? I just came by to say hello to Dr. Cabelli. Unfortunately, like so many of us, I am caught between six different things, but I did want to say hello to the distinguished doctor, who, as you know from his biography, has had an outstanding record in this particular area.

Senator LAUTENBERG. We regret it also. Thanks very much, Senator Chafee.

Mr. CABELLI. Let me respond to that if I may, Senator.

Senator LAUTENBERG. Please.

Mr. CABELLI. The illness is rather benign relative to other diseases; it ismore frequently spread by other routes. The rates, by the way, are very low; but, when they are applied against the number of people who are at the beach in a given year, the numbers of predicted cases can be high.

A point was made about other indicator systems. We probably will never have the universal panacea by way of an indicator. Clearly, enterococci are better than the fecal coliforms; but, as I noted in my testimony, they are deficient in two ways, and we are working to overcome these deficiencies.

I should say something about New Jersey, having worked with the New Jersey Department of Health and Environmental Protection for two years. New Jersey has one of the finest programs along the East Coast for translocating wastewater discharges out of your embayments and into relatively long, deep ocean outfalls. I have no doubt whatsoever that the water at their beaches is markedly cleaner than it ever was. It is my opinion that those people

who say that the water quality of the New Jersey beaches has been deteriorating are incontrovertibly wrong. The details of the needed monitoring programs should be addressed not with laws but with workshops run by EPA for the various States or by the EPA when they review the state programs. What I am trying to say is that laws are no substitute for good common sense and good science. We are better advised to allow some flexibility to the States rather than enacting section 3 of this law. In this, I could not disagree more with Dr. Hershkowitz. An incident that occurred after we had shown that the gastroenteritis rate was higher at the barely acceptable Coney Island beach than at the relatively unpolluted Rockaways beach illustrates my point. I was asked where I would swim; and I asked where I lived since, if I lived near Coney Island, I would swim at Coney Island because the risk of the benign gastroenteritis would be of much less concern to me than that of a car accident while driving from Coney Island to the Rockaways on a weekend. I was then asked if I would close the beach at Coney Island since the gastroenteritis rate was significantly higher than that for the Rockaway beach. "Not on your life" was my answer, because, if this recreational resource were denied to the highly urbanized population in the center of the city, the risk of the benign gastroenteritis could be replaced with a greater risk of social disorder. I was then asked about a massive program of pollution abatement to correct the situation. My reply was that a more modest effort would be indicated if a massive program would seriously limit the funds needed for critical programs, such as those on drug abuse or rat control.

The point I am making is that there are sociologic and economic inputs that need to be considered, that recreational water should be considered as part of a total society, and that this is better done at the local level with Federal guidelines.

Senator LAUTENBERG. That's true and I thank you for that program for balancing our social problems in urban areas. I would have to tell you this, that we have relatively limited latitude and if we can do something about the quality of water which people use for recreation, a very important source of recreation which you agree with, that I think we ought to do it.

I found in my days here that very often common sense follows law and common sense is not a substitute for law. Most laws are written in reaction to deeds done out in the communities or across the country. Most laws are in response to violations of conduct with one another. What we are trying to do here, and I think we can accomplish, is to establish criteria that meets a level to reduce as much as possible the exposure even to the benign condition, as you describe it, of gastroenteritis. I can tell you that there is lots of concern, and I don't want to get into the treatment of emotional disease here, when people go swimming and find out that the water quality is less than we would like it to be or less than it should be for their safe use. It's very upsetting to them. And just the notion of that drives people away. We have an obligation to give them as high a level of comfort index as we can.

Mr. Neafsey, would New Jersey find it acceptable to have outbreaks of gastroenteritis? Based on the standard that EPA uses,

we'd have a lot of people out there visiting their doctors after a day at the beach.

Mr. NEAFSEY. We would not find that acceptable, Mr. Chairman. And if I could just pick up on one point with respect to Delaware, they have their standards, but when their standards are exceeded, they merely issue an advisory with respect to the beach closure, which may or may not be followed. I think that is the distinction that's made with respect to our State. We'll close the beach. I do not believe that it is using an elephant gun to shoot a mosquito. I think in our State we are trying to do all we can to protect the public health and we would like to even do more. I think it is important that other States do the same because it is unfair to have one State doing all it can while its neighbor is not. And just to pick up on what Dr. Hershkowitz said, if the standards were enforced, I think we would find that other States would do more to prevent the kinds of things that we face.

Senator LAUTENBERG. Mr. Svenson, do you think that people who swim at your State's beaches believe that there is a risk that they could get sick from doing that?

Mr. SVENSON. No.

Senator LAUTENBERG. People are not concerned about the exposure?

Mr. SVENSON. Let me put it this way. Because of these programs that I described, especially in the New York metropolitan area, people are aware, one, that there is a monitoring program and, two, that when beaches are closed and signs are posted and public notices are made, they understand. They understand, unfortunately, the environmental problems that are occurring out there in the beach areas and the reason why regulatory people are staying on top of this problem, trying to get treatment plants and other capital facilities in place to take care of it. People are aware that there is somebody out there looking after them and that when the beach is opened it is being monitored and considered safe. There are a lot of resources being——

Senator LAUTENBERG. Right. So you confirm the fact, or the notion anyway, that people look to Government to tell them that these areas are safe. Are they concerned about the safety or the quality of the water in which they bathe?

Mr. SVENSON. I would say yes, they are concerned.

Senator LAUTENBERG. Sure. And these discoveries were made at a time when things were worse than they are now. We know that we can make them better as we complete the objective of the Clean Water Act, etc., as we deal with non-point source for pollution, as we deal with the CSOs, we deal with all those things, we can make them better.

Mr. SVENSON. The floatables were a significant public relations problem which we feel we have resolved.

Senator LAUTENBERG. Yes, also some risk; not just public relations.

Mr. SVENSON. But we have resolved and educated folks and certainly have a pretty good system as far as monitoring the beaches and taking actions whether closure was necessary based on floatables.

Senator LAUTENBERG. Dr. Hershkowitz, in his comments, mentioned that he thought that EPA should create "a beach health index" so that beachgoers can make an informed choice about where and when to swim. Now if I were asked, Dr. Cabelli, whether I would choose to swim in Coney Island or Rockaway, I would say Sandy Hook. But if people had that option or knowledge, I think it would serve to relieve their minds for one thing and also to prevent any kind of exposure that we can determine to be at some risk. Do you think that would be a good idea, a beach health index?

Mr. CABELLI. Yes. As a matter of fact, the City of New York publishes an annual report on the quality at all their beaches. It includes a historical background and their standards.

Senator LAUTENBERG. So then why shouldn't we have it?

Mr. CABELLI. We should have it. I would certainly endorse a requirement that all States and/or cities publish such a report annually. Incidentally, I doubt that there is a need or the monetary resources for most communities to reduce the swimming associated gastroenteritis rate to a value approaching zero.

Senator LAUTENBERG. Neither could the manufacturers of Maalox and Tums and all those other things.

We'll keep working on it and I thank you all very much for your testimony. It's good to see you here.

With that, this hearing is adjourned.

[Whereupon, at 11:30 a.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record and the bill S. 2706 follows:]

STATEMENT OF
ROBERT H. WAYLAND III
DEPUTY ASSISTANT ADMINISTRATOR FOR WATER
U. S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON SUPERFUND, OCEAN AND WATER PROTECTION
ENVIRONMENT AND PUBLIC WORKS COMMITTEE
U. S. SENATE

JUNE 28, 1990

Mr. Chairman and Members of the Subcommittee:

Good morning. I am Robert H. Wayland III, Deputy Assistant Administrator for the Office of Water, U. S. Environmental Protection Agency. I am accompanied by William R. Diamond, Director, Criteria and Standards Division, Office of Water Regulations and Standards. It is a pleasure to be here, and I appreciate the opportunity to discuss the recommendations set forth in S. 2706, the Beaches Environmental Assessment, Closure, and Health Act of 1990.

INTRODUCTION

The Environmental Protection Agency (EPA) shares the Subcommittee's concerns about protecting and enhancing the quality of the Nation's coastal beaches. We are supportive of any efforts to bring attention to the real problems that limit the use of those waters for recreation and pose health risks to beach users. However, we oppose enactment of S.2706 because authorities to address these concerns already exist, making new legislation unnecessary.

Over the past two decades, programs to control water pollution established by EPA and the States under the Clean Water Act have greatly reduced the threat of serious illness and disease from swimming at beaches. These programs include the construction of sewage treatment facilities supported by EPA funds, and the controls on direct discharges established through permits issued under the National Pollutant Discharge Elimination System (NPDES), as well as programs recently established for the control of combined sewer overflows. Most of the serious human health concerns have been eliminated. EPA programs continue to examine and where appropriate control or eliminate the less serious, mostly short-term human health effects arising from remaining discharges and nonpoint sources.

I should also add that in most States the responsibilities for protecting beaches are often split between two or more State agencies. Programs to set ambient water quality standards, and to establish and enforce controls on sources of water pollution, are usually administered by State water quality agencies. Programs to impose fishing bans and restrictions, health advisories, and swimming restrictions are usually administered by State public health agencies. Coordinating the efforts of water quality and public health authorities to protect beaches is left to the States in their role as primary protectors of public health and safety.

The bill under consideration by this Subcommittee raises issues in the areas of environmental quality criteria for pathogens, guidance on floatables, the protocols States would use for closing beaches, and selection of appropriate indicators of human-specific pathogens in marine recreational waters. I will now discuss the actions that have been taken by EPA and those that are underway in these areas.

FEDERAL CRITERIA AND STATE STANDARDS

Under the Clean Water Act, EPA is assigned responsibility for developing water quality criteria to ensure the biological, chemical, and physical integrity of our Nation's coastal resources. State water quality agencies designate uses for their waters and adopt these criteria into State water quality standards. These standards are a key element of our surface water programs, especially in establishing control requirements for pollutant dischargers. To date, all States have adopted criteria for enteric bacteria, which are used as surrogates for pathogens, in their State water quality standards, and virtually all States have narrative prohibitions in their water quality standards that apply to floatables and debris. In 1986 EPA issued a revision to its bacteriological ambient water quality criteria, based on research analyses conducted since the initial criteria were issued in 1976. The revised criteria introduced new indicator bacteria which now permit estimates of swimmer illnesses from swimming in polluted water. Since then, six

States have adopted these revised criteria. We think that the revised criteria are more precise, and we will continue to work with the remaining States to encourage their adoption. However, the older State criteria based on fecal coliform bacteria are considered to be protective for swimming activities, even though the risk of illness among swimmers is less precisely determinable.

In developing the Ambient Water Quality Criteria for Bacteria issued in 1986, EPA conducted, compiled, and analyzed a wide spectrum of research information. The research upon which the criteria are based was conducted on beaches that were officially designated for swimming and had well-defined sources of human fecal pollution. The EPA studies demonstrated that two indicator organisms, enterococci (for fresh and marine waters) and E. coli (for fresh waters), show a well-defined correlation with swimming-associated gastrointestinal illness. In addition, EPA is currently considering additional research to identify new indicator organisms from human origin.

MARINE DEBRIS AND FLOATABLES

Floatables are a ubiquitous problem in our harbors and on U.S. beaches. Floatables have caused great economic hardships on beach communities from lost revenues due to the publicity surrounding closures of beaches. Beach closures are not always necessary from a public health perspective. Floatables and other

debris also inflict significant injury or loss of life to marine mammals and other wildlife such as birds and turtles; for example, as many as 30,000 northern fur seals die every year due to entanglement in debris, and as many as one million seabirds die due to ingestion of plastic pellets or pieces.

The Congress has acknowledged these problems in the past, and has enacted legislation such as the Ring Carrier Act, the Marine Plastics Pollution Research and Control Act, and the Shore Protection Act. EPA has reacted to this legislation, and has prepared a number of reports to the Congress, such as the February 1990 report on Methods to Manage and Control Plastic Wastes.

With these concerns in mind, EPA is developing a multi-phased program to determine the sources and effects of floatables and establish appropriate control measures, such as public education and prevention programs. The floatables program, which I will briefly describe below, is being implemented as part of a cooperative effort with other Federal agencies and industry/environmental organizations.

We are engaged in a number of projects to identify the types, quantities, and sources of marine debris. We have partially sponsored national beach clean-ups during Coastweeks through an Inter-Agency Agreement with the National Oceanic and

Atmospheric Administration and a grant to the Center for Marine Conservation (CMC). Data obtained from the clean-ups is being used to assess the types of debris present on beaches around the country, and will also be used in the future to monitor the effects of various control measures. This is an area where consistent protocols are needed to ensure that the data will be valid on a national basis.

EPA is also conducting surveys of U. S. harbors to investigate the compos_tion of floating debris from them. The eleven harbors surveyed to date are: Boston, New York, Philadelphia, Baltimore, Miami, Seattle, Tacoma, San Francisco, Oakland, Norfolk and Galveston. Information obtained from these surveys will be used to assess harbors as potential sources of debris to other coastal areas.

Data from the national harbor surveys have also revealed a correlation between certain debris items and the presence of combined sewer overflows (CSOs). We thus initiated a study of materials released from several CSOs in Philadelphia, PA and Boston, MA. EPA will use the results of these studies to determine the appropriate actions to be taken under the Clean Water Act (CWA). Storm drains are also being sampled during this study to determine their significance as a source of marine debris.

EPA is also sampling floating debris in sewage treatment facilities to determine what could be released from CSOs during heavy rains. We are also working with the plastics industry to determine how plastic pellets enter the environment and to determine what the industry and government can do to better control these releases.

In addition to the annual beach clean-ups, EPA is involved in a number of activities designed to increase public awareness and involvement in the marine debris issue. Through an Inter-Agency Agreement with NOAA, EPA is helping to fund CMC's marine debris information distribution centers in Washington, D.C. and San Francisco, California. Funding has also been provided to CMC for the production of a public service announcement on marine debris. We are developing educational material which includes a school curriculum that addresses such subjects as the sources and effects of marine debris and relevant pollution prevention techniques, and we have prepared a bibliography on marine debris which will be useful to the general public who wish to learn more about the subject.

We are in the early stages of developing a guidance document for local beach authority use, which will provide guidelines for determining the need to close a beach due to debris present on the beach or in the water offshore from a beach. It will describe how to handle medical waste found on the beach, and

develop a central contact point to report medical waste washups. It will further describe guidelines for determining when it is safe to re-open a beach.

Several of our activities on assessment and control of floatables have identified needs similar to the provisions of the Act, including (1) consistent beach monitoring and testing protocols and (2) further assessments of the sources and control mechanisms for floatables. In the area of beach closure criteria, because the nature and characteristics of floatables preclude a traditional criteria approach, it may be more appropriate for guidance to be prepared on what to do when a wash-up occurs. The guidelines could provide a useful tool for use by the local beach community in determining whether beach closure or some other action is warranted.

I would like to emphasize that floatables are a problem on all of our Nation's coastlines, and while the EPA activities that I described are significant, all levels of government have extensive work to do before we get the problem under control.

CONCLUSION

Mr. Chairman, this concludes my statement. I believe all of the EPA actions and activities I have described are relevant to the issues you are addressing in S.2706. I would be pleased to answer any questions that the Subcommittee may have.

Natural Resources Defense Council

1350 New York Ave., N.W.
Washington, DC 20005
202 783-7800
Fax 202 783-5917

TESTIMONY OF

THE NATURAL RESOURCES DEFENSE COUNCIL

ON THE

BEACHES ENVIRONMENTAL ASSESSMENT, CLOSURE, AND HEALTH ACT OF 1990
S. 2706

BEFORE THE SENATE COMMITTEE
ON ENVIRONMENT AND PUBLIC WORKS

Thursday, June 28, 1990

prepared by

Allen Hershkowitz, Ph.D.
Diane M. Cameron
Jennifer Kassalow

100% Recycled Paper

40 West 20th Street
New York, New York 10011
212 727-2700
Fax 212 727-1773

90 New Montgomery
San Francisco, CA 94105
415 777-0220
Fax 415 495-5996

617 South Olive Street
Los Angeles, CA 90014
213 892-1500
Fax 213 629-5389

212 Merchant St., Suite 203
Honolulu, Hawai'i 96813
808 533-1075
Fax 808 521-6841

My name is Dr. Allen Hershkowitz and I am an environmental scientist with the Natural Resources Defense Council. The Natural Resources Defense Council (NRDC) is a national, non-profit environmental organization with over 140,000 members and a professional staff of attorneys and scientists dedicated to protecting public health and the environment. NRDC is a leading advocate and participant in the development of both national and local programs to protect water quality in our coastal waters. We appreciate the opportunity provided by your invitation to NRDC to share our research and positions on your proposed bill, the "Beaches Environmental Assessment, Closure, and Health Act of 1990" (S.2706) as well as on certain of the other issues about which the Subcommittee has requested testimony.

In an appearance I made before this Committee one year ago, Senator Lautenberg asked me whether it was likely that beaches would close again during the summer of 1989, as they did in 1988. The summer of 1988, as you remember, was distinguished by medical debris wash-ups in the Northeast that caused many beach closures and literally billions of dollars in lost revenues to coastal communities that depend on beach attendance. Responding to the question I pointed out that because sewage generated bacteria was the main cause of beach closures, NRDC did expect perhaps as many as 80 to 100 beach closures in the New York tri-State area, depending on precipitation levels and how well our sewage treatment facilities were able to function. In fact, as the

appendix to this testimony documents, in 1989 there were 578 closures in New York, New Jersey, and Connecticut. This is five times the number we predicted.

As you may know, NRDC has reviewed data on beach closures for 10 coastal states that host some of America's greatest water resources. These states are California, Connecticut, Delaware, Florida, Maine, Maryland, Massachusetts, New Jersey, New York, and Rhode Island. We have also assessed the causes of beach closures as well as individual states' beach closure standards. What follows is a summary list of our preliminary findings:

> High levels of bacteria in coastal waters are responsible for the overwhelming majority of the beach closures in the United States, particularly along the North Atlantic coast. During the summer of 1989 there were more than 764 beach closures in the ten states under review due to sewage contamination. In New York, four beaches were closed for the entire summer season, while nine were closed for weeks at a time.
>
> There were 578 closures in New York, (not including New York City beaches) New Jersey, and Connecticut alone, more than three times the number of closures reported in the remaining seven states studied. Among New York State beaches, Long Island Sound beaches in Long Island and Westchester County were the most frequently contaminated and closed. Long Island's south shore beaches experienced few closures.
>
> No enforceable federal standards mandating uniform (or minimum) beach closure standards exist. Indeed, current federal EPA recommended guidelines allow even "clean" beaches that meet levels considered "safe" to contaminate 19 out of every 1,000 swimmers with gastroenteritis (19,000 out of a million).
>
> Definitions of indicator organisms, testing protocols and beach closure standards vary substantially from state to state. For example, while a certain bacteria level would likely cause a beach closure in New Jersey,

the same level of bacterial contamination at a New York beach would not cause its closure despite equivalent health risks.

Of the ten coastal States reviewed by NRDC, only New Jersey mandates that beaches close if bacteria tests indicate that "safe" levels have been exceeded.

Of all the state standards we reviewed, Maine tolerates the lowest concentration of bacteria, while New York tolerates the highest concentration and yet reports the highest number of beach closures. However, to expedite public health protection, New York sometimes preemptively closes beaches following periods of high precipitation and in advance of receiving water quality test results. Nevertheless, New York uses a standard more lenient than the criteria recommended by the National Technical Advisory Committee more than twenty years ago in 1968.

Within Massachusetts, New York and Maine, municipalities or local health departments have different standards for beach closure. These inconsistencies make it difficult for state agencies to keep organized and up-to-date records of beach closures.

The guidelines of the World Health Organization are more stringent than those of the U.S., and have been adopted by many countries.

Inconsistent federal and state water quality standards for pathogens in recreational waters, inadequate sewage conveyance and treatment facilities, the lack of mandatory beach closure provisions for beaches exceeding criteria, and inadequate public notification procedures combine to present a potential risk to public health.

(See tables one and two)

TABLE I OCEAN BEACH CLOSURE STANDARDS, INDICATOR ORGANISMS AND TESTING METHODS (Selected States)

		STANDARD			
JURISDICTION	*INDICATOR ORGANISM*	*GEOMETRIC AVERAGE (1)*	*MEDIAN (2)*	*INSTANTANEOUS LEVEL (3)*	*TESTING METHOD*
EPA 1986 RECOMMENDED CRITERIA (4)	Enterococcal	35 p/100 ml (5)			MF (6)
CALIFORNIA (7)	Total coliform	1,000 p/100 ml (20% not to exceed 1,000 p/100 ml)		10,000 p/100 ml	MPN or MF (J)
CONNECTICUT (9)	Enterococcal	33 p/100 ml		61 p/100 ml	MF
DELAWARE (10)	Enterococcal	52 p/100 ml		156 p/100 ml and 52 p/100 ml (11)	MF
FLORIDA (12)	Total coliform	1,000 p/100 ml		2,400 p/100 ml	MF
	& Fecal coliform	200 p/100 ml (10% of samples not to exceed 4000 p/100 ml)		800 p/100 ml	or MPN
MAINE (13)	Enterococcal	8 p/100 ml		54 p/100 ml	MF
MARYLAND (14)	Fecal coliform			200 p/100 ml (10% of samples not to exceed 4000 p/100 ml)	MPN
MASSACHUSETTS (15)	Total coliform	1,000 p/100 ml			MPN or MF
NEW JERSEY (16)	Fecal coliform	200 p/100 ml		200 p/100 ml	MPN or MF
NEW YORK (17)	Total coliform or	2,400 p/100 ml (20% not to exceed 5,000 p/100 ml)			MPN or MF
	Fecal coliform	200 p/100 ml		1,000 p/100 ml	MPN or MF
RHODE ISLAND (18)	Total coliform &		700 p/100 ml (10% not to exceed 500 p/100 ml)		MPN
	Fecal coliform		50 p/100 ml (10% not to exceed 500 p/100 ml)		MPN

Compiled by the Natural Resources Defense Council. For more information, contact Allen Hershkowitz (212) 727-4486 or Jennifer Kassalow (212) 727-4491

CHART 1

1 Geometric Average: A geometric average is to be used when evaluating the long term microbiological suitability of recreation water quality. The geometric mean can provide a good indication of water quality over time. This holds true when evaluating a proposed swimming area where seasonal or incidental variations may impact on single sample results.
source: Guidelines for Monitoring Bathing waters and Closure Protocol, May, 1989. Connecticut Department of Health Services, Connecticut Department of Environmental Protection, Connecticut Environmental Health Association, Connecticut Association of Director of Health.

2 Median: The value determined when 50% of the samples are above "X", 50% are lower than "X". If there is only one number, it is the median.

3 Instantaneous Level: An instantaneous sample (single sample) is done one time, at any time. To be read (if you ever take a sample higher than "X", the sample does not meet the standard). Noncompliance is signalled by an unacceptably high value for any single (instantaneous) bacteria sample. States generally set the maximum acceptable bacterial density for an instantaneous sample higher than that for the geometric average, in order to avoid unnecessary (or frequent) beach closings based on single samples.

4 Source: U.S. Environmental Protection Agency. Bacteriological, Ambient Water Quality Criteria for Marine and Fresh Recreational Waters. Cincinnati, OH and Office of Water Regulations and Standards, Criteria and Standards Division, Washington, D.C. 1986, p. 5.

5 35 p/100 ml: 35 colonies per one hundred mililiters of water.

6 MF: For the Membrane Filtration (MF) method, an appropriate volume of a water sample or its dilution is passed through a membrane filter that retains the bacteria present in the sample. The filter retaining the microorganisms is placed on a petri dish with a medium and is incubated. The medium, the incubation temperature and time all vary depending upon which indicator one is testing for. Bacteria colonies are counted under low magnification and the number of the indicator are reported per 100 ml of original sample.

7 Source: Mr. Dave Quinton, Consulting Sanitarian, California Department of Health Services, per. communication, January, 1990.

8 MPN: The Most Probasle Number Procedure estimates the number of specific organisms in water and waste water by the use of probasility tasles. This method detects and estimates the total and fecal coliforms through a series of lauryl tryptose broth fermentation tubes which are innoculated with decimal dilutions

of the sample. Labs may use varying numbers of test tube samples. Greater specificity requires more sampling.

9 Source: Mr. Frank Homiski, Senior Environmental Sanitarian, Connecticut Health Department, per. communication, December, 1989.

10 Source: Mr. Richard Howell, Program Administrator, Delaware Health and Social Services, per. communication, February, 1990.

11 Source: Ms. Roxane Dow, Chief, Bureau of Surface Water Management, Florida Department of Environmental Regulation, per. communication, March 15, 1990

12 Source: Mr. Robert Burhans, Chief Sanitarian, New York State Health Department, per. communication, March 21, 1990.

13 Source: Ms. Mary Jo Garreis, Chief, Standards and Certification Division, Maryland Department of Environmental Protection, per. communication, December, 1989.

14 Source: Mr. Paul DiPietro, Program Manager for Water Quality, Metropolitan District Commission, Boston, Massachusetts, per. communication, April 23, 1990.

15 Source: Mr. Bob Runyon, Chief, Bureau of Monitoring Management, New Jersey Department of Environmental Protection, per. communication, March 6, 1990.

16 Source: Mr. Ramesh Kapur, Senior Sanitary Engineer, NY State Health Department, per. communication, December, 1989.

17 Source: Mr. Joe Migliori, Senior Environmental Scientist. Rhode Island Department of Environmental Management, per. communication, March 13, 1990.

TABLE II

	ARE BEACH CLOSURES MANDATED IN THE STATE?	DOES A STATE STANDARD FOR FLOATABLE(1)/MEDICAL WASTE(2) EXIST?	DO ALL COUNTIES/ MUNICIPALITIES IN IN THE STATE FOLLOW THE SAME STANDARD?	WHAT DAY IS WATER QUALITY TESTING DONE ON?	WHEN WAS THE WATER QUALITY STANDARD LAST REASSESSED?	HOW MANY BEACH CLOSURES DUE TO BACTERIA OCCURRED IN 1988 AND 1989?
CALIFORNIA (3)	NO	NO	YES	VARIES	1985	1988: AT LEAST 84 1989: AT LEAST 99
CONNECTICUT (4)	NO	NO	YES	VARIES	1989	1989: AT LEAST 68
DELAWARE (5)	NO	NO	YES	MONDAYS & TUESDAYS	1990	1988: 56 ADVISORIES 1989: 1 ADVISORY
FLORIDA (6)	NO	NO	YES	VARIES	1987	1988: NONE 1989: NONE
MAINE (7)	NO	NO	NO	MONDAYS, TUESDAYS & WEDNESDAYS	1985	1988: NONE 1989: 1
MARYLAND (8)	NO	NO	YES	VARIES	1990 (IN PROCESS)	1989: 2 ADVISORIES
MASSACHUSETTS (9)	NO	NO	NO	VARIES	1990 (IN PROCESS)	1988: AT LEAST 60 1989: AT LEAST 75
NEW JERSEY (10)	YES	NO	YES	MONDAY	1985/1986	1988: 37 1989: 136
NEW YORK (11)	NO	YES	NO	VARIES	1990 (IN PROCESS)	1988: 473 PLUS 1 BEACH HAD AN ADVISORY FOR ENTIRE SUMMER 1989: 287
RHODE ISLAND (12)	NO	NO	YES	MONDAYS, TUESDAYS & WEDNESDAYS	1986/1987	1988: NONE 1989: NONE

Compiled by the Natural Resources Defense Council. For more information, contact Allen Hershkowitz (212) 727-4466 or Jennifer Kassalow (212) 727-4481

CHART II

1 Source: Mr. Dave Quinton, Consulting Sanitarian, California Department of Health Services, per. communication, January, 1990.

2 Source: Mr. Frank Homiski, Senior Environmental Sanitarian, Connecticut Health Department, per. communication, December, 1989.

3 Source: Mr. Richard Howell, Program Administrator, Delaware Health and Social Services, per. communication, February, 1990.

4 Source: Ms. Roxane Dow, Chief, Bureau of Surface Water Management, Florida Department of Environmental Regulation, per. communication, March 15, 1990.

5 Source: Mr. John Sowles, Biologist, Maine Department of Environmental Protection, per. communication, December, 1989.

6 Source: Ms. Mary Jo Garreis, Chief, Standards and Certification Division, Maryland Department of Environmental Protection, per. communication, December, 1989.

7 Source: DePietro, Paul, Program Manager for Water Quality, Metropolitan District Commission, Boston, Massachusetts, per. communication, April 23, 1990.

8 Source: Mr. Bob Runyon, Chief, Bureau of Monitoring Management, New Jersey Department of Environmental Protection, per. communication, March 6, 1990.

9 Source: Mr. Ramesh Kapur, Senior Sanitary Engineer, NY State Health Department, Telephone Interview, December, 1989.

10 Source: Mr. Joe Migliori, Senior Environmental Scientist. Rhode Island Department of Environmental Management, per. communication, March 13, 1990.

Given these findings, NRDC supports the concepts embodied within S. 2706, insofar as it would reduce the substantial variation among states beach closure criteria. However, we would like to suggest a number of refinements to make the proposed legislation more workable.

Of course, the proposed bill stops short of recommending well funded reforms necessary to hit at the heart of beach closures. No beach closure standard by itself can clean up waters contaminated caused by sewage and other sources of pollution. NRDC documented this pollution and developed a plan of action last year in Ebb Tide for Pollution: Action for cleaning Up Coastal Waters, which we ask to be included in the record of this hearing. NRDC has been working with this committee on coastal pollution legislation designed to attack these problems. NRDC strongly supports S. 1178, the Coastal Protection Act of 1990, which was reported out of this committee on June 12th. This legislation will, if enacted, make major contributions to our efforts to control beach contamination sources such as sewer overflows and poison runoff.

Right-to-Know. NRDC also suggests that S. 2706 would be greatly strengthened if it were coupled with the establishment of the "Public Right-to-Know" about bathing beach water quality. If States are to upgrade and revise their monitoring and testing

procedures, these upgrades will be most useful if beachgoers themselves will have access to the information thus generated. In order to achieve this goal of full public notification, NRDC suggests that a Clean Coastal Beaches Council be established and charged with developing a "Bathing Beach Water Quality Index" akin to the familiar "Air Quality Index." The Bathing Beach Water Quality Index would be a qualitative snapshot of the quality of a given coastal water on a given day or week.

Uniform Criteria. NRDC applauds the intention of S. 2706 to establish uniform beach testing and monitoring practices. Currently there are two bacteria indicator organisms (BIO) that are used to assess recreational ocean water quality. These are: 1) the coliform bacteria, and 2) the enterococcal bacteria (pronounced en-ter-o-kok'-al). Coliform is an aerobic, rod-shaped bacteria whose normal habitat is the large intestine of humans and other warm blooded animals. It enters the environment via human and animal feces. Coliform is always present when sewage is present, it survives longer in water than most pathogenic bacteria and it is easily isolated and identified. Coliform concentrations can be calculated by measuring two different concentrations of the bacteria. One assessment is known as the "total coliform" concentration and the other assessment is known as the "fecal coliform" concentration. The fecal coliforms are part of the total coliform group.

Enterococci are a group of bacteria that also inhabit the intestinal tract of humans and other warm-blooded animals and also enter the environment via human feces. The presence of enterococci verify fecal pollution and may provide additional information concerning the time and probable origin of pollution. A number of complex factors govern which indicator bacteria best measures the threat to human health from contaminated beach water. NRDC is in the process of studying this issue now, but it is clear that steps are needed to ensure that swimmers in different states receive equivalent, adequate protection from bacteria and other pathogens.

Uniform Testing Methods. NRDC supports proposals in Section 2 of S. 2706 to establish uniform testing protocols. Of the ten states reviewed by NRDC, two testing methods are most frequently used to determine whether ocean water samples meet health standards. Although both tests are referred to by a few different names and have several methodological variations, the two test methods are generally referred to as 1) Most Probable Number Method (MPN) and 2) Membrane Filtration Technique (MF). Both tests can be used to identify any of the bacterial indicator organisms, but EPA recommends testing for enterococci only with the MF method.[1] The only states that use the MF method are Connecticut, Maine and Delaware, while New Jersey, Florida, and New York use both testing methods. The states that use only the MPN method include California, Maryland, and Rhode Island.

Each test has its advantages and limitations. For example, MF provides greater precision and faster results than MPN[2]. Precision is greater with the MF than MPN method because MF makes a direct count of the bacteria present in the water sample, while MPN uses less accurate probability calculations. Using the MF method, results for total and fecal coliforms can be obtained in 22-26 hours[3] and results for enterococcus can be obtained in 48 hours[4]. It can take 48-96 hours to calculate total and fecal coliform levels and 72 hours to confirm the presence of enterococci with the MPN testing procedure. The longer the delay in obtaining results, the longer recreational swimmers may be at risk.

Each test is performed differently for each bacteria indicator organism. The Most Probable Number method detects and estimates the total and fecal coliforms through a series of lauryl tryptose broth fermentation tubes, which are inoculated with decimal dilutions of the sample. The formation of gas at 35C within 48 hours constitutes a positive presumptive test for members of the total coliform group while formation of gas at 44.5C at 24 hours confirms fecal coliform.

For the Membrane Filtration method, an appropriate volume of a water sample or its dilution is passed through a membrane filter that retains the bacteria present in the sample. The filter

retaining the microorganisms is placed on a petri dish with a medium and is incubated at 35C . The medium, the incubation temperature and length of incubation all vary depending upon which indicator one is testing for. Bacteria colonies are counted under low magnification and the number of the indicator are reported per 100 ml of original sample.

The length between test periods can add to the risk posed to the public because during the time required for testing to be completed, swimming beaches may remain open even if contaminated.

Conclusion. In conclusion, let me add that we have for a long time used water to carry away our wastes, including human waste. But we also use water bodies for recreation, as places to swim and wade. Unfortunately, these uses are sometimes in conflict. Federal and state policymakers, local public health officials, and environmental engineers have much more work to do before marine beachgoers can swim with full confidence that their own and their children's health is fully protected. Viruses are believed to be the major cause of swimming-associated diseases; worldwide, gastroenteritis and hepatitis are two of the most common swimming-associated diseases caused by viruses. Gastroenteritis is actually a common term for a disease that can have one or all of the following symptoms: vomiting, diarrhea, stomachache, nausea, and fever. In addition to viral agents, bacteria can also cause gastroenteritis. Other bacterial diseases

that can be contracted by swimmers include salmonellosis, shigellosis, and cholera. Other microbial pathogens found at varying concentrations in recreational waters include amoeba and other protozoa that can cause giardiasis, amoebic dysentery, skin rashes, and "pink eye" condition.

Thank you for giving me the opportunity to present the views of NRDC on the Beaches Environmental Assessment, Closure, and Health Act of 1990. I will gladly answer any questions that you may have.

NOTE: The appendix to this statement has been retained in committee files.

WRITTEN TESTIMONY prepared by *Victor J. Cabelli, Ph.D.*

Concerning Senate Bill S.2706

The copies of the two papers* and the information I will present orally respond to most of the questions posed to me by the chairman of the subcommittee. I do have some views on the application of the standards and the management of recreational resources which may be of value to these deliberations.

"Closing" beaches temporarily during the bathing season based on information derived from indicator data is self-defeating since, in many cases, the situation has cleared up before the microbial information is available. In effect, the barn door is closed after the horse or what is erroneously thought to be the horse has escaped. Moreover, to do so using one or two values against a limit which was developed for application as a geometric mean is mathematically inappropriate. In addition, for such closures to be truly effective, samples would have to be collected daily. The better and often used recourse is to "close" beaches or issue public health advisories, if necessary, based on the conditions which experience has shown will cause unacceptable increases in the indicator levels at the beach. I will use as examples the conditions given in Section 3 (ii and iii) of S.2706.

Malfunctions at a sewage treatment plant (STP) should be detected at the source; and the need, if any, and duration of a "closure" (public health advisory) at a beach should be based on data obtained at the time the STP or the outfall for the effluent was constructed. It may be of interest to test the water before the beach is "reopened". I would suggest, however, that, as noted, the length of the required closure should have been determined quite some time earlier.

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*The papers referred to have been retained in committee files.

Rainfall events which do not lead to combined sewer overflows (CSOs) and in which the stormwater contains very little, if any, human fecal wastes requires a different management procedure. Clearly this is an area which needs further research. Nevertheless, if the necessary sanitary surveys (hopefully, in time, this will include tests for a more human fecal-specific indicator in the storm drains) have been conducted, it would be appropriate to issue a public health advisory at the beginning of the bathing season saying that it might be judicious but not imperative to forgo swimming at the beach for a given number of hours following a rainfall of a given magnitude. Furthermore, it would be reasonable to use "dry weather data" to classify the beach under these circumstances.

Rainfall which leads to CSOs which appreciably increase the enterococcus levels at the beach is another matter. Clearly, these should be eliminated. In the meantime, there are two alternatives. The first is to collect samples randomly and use the data such that wet and dry weather conditions are represented in the data set. The second is to classify based on dry weather data and issue health advisories following rainfall events of a magnitude expected to result in unacceptable enterococcus levels at the beach. It could properly be argued that this, in effect, requires a single value enterococcus limit. Those are given in the 1986 USEPA document, although a somewhat more relaxed single value limit might be acceptable.

Item (i) in Section 3 relates to sampling frequency. The sampling frequency required depends on a number of factors specific to the location and, hence, will vary from situation to situation.

The following would be my advice concerning one possible management protocol which is, in part, taken from practices used by various states and local regulatory agencies.

1. Prior to the bathing season

a. Classify the beaches using data obtained during the previous bathing season against the state and/or local standards (weekly samples should provide a minimum of 15 values per station).

b. Publish an annual report, including the essentials of the classification, monitoring and management programs, the classification of the beaches (including the essentials of the data base and possibly the predicted illness rates), a historical perspective of the water quality, and major improvements in control technology.

c. Prepare a synopsis of the report for dissimination to the media including any necessary health advisories.

d. Post those beaches considered unacceptable for swimming.

2. During the bathing season (including the previous month)

a. Conduct a monitoring program to produce the data base for next year's classification.

b. For each beach (sampling station), maintain a running geometric mean (GM) of the previous ten enterococcus values. When they exceed the USEPA guidline, close the beach and do not reopen it until the GM is within the guideline.

c. Repeat 1c as required.

d. Issue public health advisories as needed because of treatment plant malfunctions, CSOs, or very unusual meteorological and/or hydrographic conditions.

Thus, it seems to me that, as of 1986, the USEPA has provided to the states the essential guidance needed for their development of standards. This includes the criterion, a guideline and the microbial methodology. Additional guidance can be obtained in a workshop and/or at the time the USEPA reviews a given state program. Thus, I see no need for the provisions of Section 3 of S.2706. It is my opinion, however, that the provisions of sections 4 and 5 are very important and should be enacted.

TESTIMONY BEFORE THE SUBCOMMITTEE ON SUPERFUND, OCEAN AND WATER PROTECTION COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS U.S. SENATE

June 28, 1990

Statement of Richard W. Svenson, P.E., M.P.A., Director
Bureau of Community Sanitation and Food Protection
Center for Environmental Health
NYS Department of Health

Good morning. I am Richard W. Svenson, Director of the Bureau of Community Sanitation and Food Protection of the New York State Department of Health. I would like to thank you for the opportunity to testify on S.2706 (Beaches Environmental Assessment, Closure and Health Act of 1990).

In New York State, the protection of water quality and the public health at bathing beaches is a shared responsibility.

The NYS Department of Environmental Conservation is responsible for the classification of waters for their best usage and for the establishment of water quality criteria to protect that usage.

The New York State Health Department is responsible for administration and enforcement of regulations promulgated by the State's Public Health Council regarding adequate bather supervision and water quality. The Department's oversight of the enforcement of the State Sanitary Code involves coordination with 37 county and city health departments and 10 State District Offices. These programs are continuously evaluated and training supplied to involved officials. The

Department also has the responsibility for certification of laboratories that perform water quality analysis of beach water samples. The county and city health departments are the State's guardians of the coastal and Great Lake public bathing areas and have routinely monitored beach water quality for the opening and closure of public bathing beaches. In the New York Metropolitan Area, the Suffolk, Nassau and Westchester County and the New York City Health Departments have spent significant resources over many years in developing comprehensive sampling programs and water quality models. Sanitary surveys, coupled with the existing knowledge of the: (1) location of discharges from storm and sanitary sewers and sewage treatment facilities, (2) tidal and scouring affects, (3) rainfall impact, etc., have been used to determine the need to close and open beaches. The Monroe County Health Department on Lake Ontario utilizes similar models and programs to monitor water quality.

Water Quality Protection

New York has a long history in the use of water quality criteria to protect the public health and safety of its citizens. Bathing waters have water quality standards specified in regulation by which it is determined if a particular water can be appropriately designated for a bathing use. The principal criteria which are used are total and fecal coliform indicators. Our regulatory programs are predicated upon meeting these criteria. In coastal areas, this has resulted in a massive construction program of treatment plants to treat municipal wastes.

JUN 21 '90 13:43

However, the job is not done. We still must address the significant threat to bathing waters caused by Combined Sewer Overflows and Stormwater Runoff.

Communities, such as New York City and Rochester, have embarked on massive programs to address this concern. New York City is committed to a multi-billion dollar program to address water quality problems caused by Combined Sewer Overflows and the states await the promulgation of Federal Stormwater Regulations to add to the quiver of regulatory authority that can be used to help protect the public health.

Public Health Oversight

As I indicated, for the day-to-day decisions on beach closures, New York relies on a long-established program of sanitary surveys which includes bathing criteria and monitoring protocols. In recent years, this has been augmented by additional guidance to address concerns related to floatable debris that was such a significant factor in beach closures in the summer of 1988 in the New York City Metropolitan Area. In fact, the medical waste concern was carefully reviewed with the involved city and county health departments, the State Office of Parks, Recreation and the Departments of Environmental Conservation and Health. Part of the problem is the need to educate the public and beach operators. In response to that need, two brochures were produced and distributed early last year and are submitted to the Subcommittee for its review.

The beach closure decisions are made by local public health officials who rely on monitoring information and knowledge of local conditions to make the important decision on when to close a beach and when to reopen a beach after a pollution incident. Some beaches in New York City are closed for the entire bathing season because it is known that water quality criteria cannot be met. Other, more difficult decisions on intermittent closures must be made routinely by these officials. Biannually, a summary of these closures is prepared and made available to various State and Federal agencies. A list of 1988 and 1989 closures is being submitted to the Subcommittee.

The New York State Department of Health compiles statistics on the reported incidences of related illnesses at bathing beaches. The record is a good one. Reports of water-related incidences of illness are few and no epidemics at coastal beaches have been recorded in the last 10 years or more.

Water Quality Indicators

Current debate has focused on indicators, most specifically bacteriological indicators utilized for closure of beaches. The Department of Health has for some time used total coliform. In 1988, it allowed the option of fecal coliform. In 1984, we did take a look at the Federal EPA proposals for e.coli and entercocci. We concluded that although these two tests are better indicators for pathogens, the linear correlation of these water quality parameters to GI illness is inadequate to utilize such numbers for regulatory purposes. In fact, information regarding sampling frequency, tidal and rainfall effects, sanitary surveys, etc., must be combined for comprehensive bathing beach

surveillance. In commenting on that proposal, we had urged EPA to consider more research to get better numbers.

In addition to bacteriological, the New York State Sanitary Code contains language that requires beach closure or restrictions when chemical, physical and biological quality including chemical discharges, deposits, growths, oils, grease, aquatic vegetation, algae and other substances in the water create a health or safety hazard.

It is with these facts that I offer the following comments regarding the proposed legislation.

Position

The existing standards and guidelines used in New York State have been effective. They have been accepted and used by public health professionals at the local levels to make decisions regarding beach closures. In fact, we have not had any documented disease outbreaks due to the use of New York beaches in at least the last ten years.

New York State utilizes multiple criteria in its regulation of bathing beaches. The proposed legislation also requires multi-criteria regarding the monitoring of marine recreational waters nationwide. We are pleased that the bill clearly indicates that the states are: (1) to be consulted by EPA in its review and development of proposed standards; and, (2) will be given the option of adopting their own standard as long as it meets a uniform set of criteria or objectives. If a state fails to adopt a water quality standard, we recommend that the existing provisions of the Clean Water Act be followed which require

EPA to promulgate such standard for the state so that standards are not enacted by default.

We fully support the priority given to further research and study to identify indicators of human specific pathogens in marine recreational waters. We previously asked that EPA do more work in this area so that a firm foundation can be established if indicator numbers are to be used for regulatory purposes.

The development of environmental quality criteria that will establish guidelines for pathogens and flotables will be helpful. We recognize the issue of uniform criteria is a concern that must be addressed. It is with this in mind that we support the state of New Jersey's work as part of the National Estuary Program and New York Bight Restoration Program to develop better human specific indicators that can more closely approximate the survival of viruses in the marine environment.

We also recognize the problem with current indicators and look forward to completion of the New Jersey Alternative Indicator Study and The National Indicator Study which is targeted at shellfish safety.

In summary, New York State believes the proposed bill provides for a workable regulatory framework. We urge that the scientific and public health community be given every opportunity to review the protocols and findings of EPA's research in order to reach a consensus on the regulatory criterion.

TESTIMONY OF THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
BEFORE THE
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

JUNE 28, 1990

S. 2706
A BILL TO IMPROVE PUBLIC SAFETY AND
QUALITY OF MARINE RECREATIONAL WATERS

THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION IS PLEASED TO HAVE THE OPPORTUNITY TO COMMENT ON THIS PROPOSED LEGISLATION. WE CONSIDER OUR MARINE BEACHES TO BE UNIQUE AND VALUABLE RESOURCES WHICH NOT ONLY PROVIDE IMPORTANT RECREATIONAL OPPORTUNITY FOR THE PEOPLE OF MAINE, BUT WHICH ATTRACT THOUSANDS OF OUR NEIGHBORS FROM THE EASTERN UNITED STATES AND CANADA. WITH THIS RESOURCE IN OUR TRUST, THE STATE HAS CONTINUED TO PURSUE AN AGGRESSIVE PROGRAM TO PROTECT THE QUALITY OF THESE WATERS AND TO PROVIDE A MONITORING PROGRAM WHICH INVOKES PUBLIC CONFIDENCE. BASED ON THIS EXPERIENCE, WE WOULD LIKE TO ADDRESS S.2706.

TO BRIEFLY DESCRIBE MAINE'S PROGRAM, THE STATE HAS SET BACTERIA STANDARDS FOR ALL ITS WATERS. IN 1986, THE STATE REVISED ITS BACTERIA STANDARDS TO USE ESCHERICHIA COLI FOR FRESHWATER AND ENTEROCOCCUS FOR MARINE WATERS. THIS WAS DONE BASED ON RECENT RESEARCH BY THE U. S. ENVIRONMENTAL PROTECTION AGENCY AND OTHER RESEARCHERS INDICATING THE SUPERIOR VALUE OF THESE INDICATOR ORGANISMS IN PREDICTING RISK ASSOCIATED WITH WATER CONTACT RECREATION. FOR MARINE WATERS, THE STATE ADOPTED CRITERIA OF "AS NATURALLLY OCCURS" FOR CLASS SA, THE HIGHEST CLASS OF WATER, AND GEOMETRIC MEANS OF EIGHT ENTEROCOCCUS PER 100 MILLILITERS FOR CLASS SB

AND FOURTEEN ENTEROCOCCUS PER 100 MILLILITERS FOR CLASS SC. INSTANTANEOUS MAXIMUM VALUES ARE ALSO USED. THESE CRITERIA RELATE TO RISK LEVELS OF CONTRACTING A WATERBORNE DISEASE, TYPICALLY MILD GASTROENTERITIS, OF ESSENTIALLY ZERO PER THOUSAND INDIVIDUALS FOR CLASS SA, FIVE PER THOUSAND FOR CLASS SB, AND TEN PER THOUSAND FOR CLASS SC. MONITORING IS CONDUCTED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, THE DEPARTMENT OF HUMAN SERVICES AND MOST COMMONLY BY MUNICIPALITIES. THE AUTHORITY TO CLOSE A BEACH IS WITH THE LOCAL HEALTH OFFICER IN A MUNICIPALITY. THE STATE ACTS AS A TECHNICAL RESOURCE; PROVIDING DATA, LABORATORY SUPPORT, SANITARY SURVEYS, AND OTHER GUIDANCE TO THE MUNICIPALITY AND THE PUBLIC.

THE PROPOSED LEGISLATION PROVIDES A NUMBER OF USEFUL PROVISIONS THAT WE WOULD LIKE TO SEE INCLUDED IN THE NATION'S WATER QUALITY PROGRAM. WE ALSO FIND SOME OF THE SUGGESTED PROVISIONS TO BE UNNECESSARY IN ACHIEVING THE PURPOSES OF THE LEGISLATION.

FIRST, WITH RESPECT TO SECTION 3 OF THE BILL, THE PROPOSED CHANGES TO SECTION 304(a), IT IS RECOMMENDED THAT THE ADMINISTRATOR BE REQUIRED TO ISSUE GUIDANCE FOR THE STATES RATHER THAN ATTEMPT TO SET CRITERIA WHICH COULD BE UNIFORMLY APPLICABLE TO THE NATION'S WATERS. WE FEEL IT WOULD BE INCONSISTENT WITH OTHER WATER QUALITY CRITERIA THAT TEST PROCEDURES AND PROTOCOLS FOR THE FREQUENCY OF TESTING BE SET BY THE ADMINISTRATOR. THE GREAT VARIABILITY OF CONDITIONS DO NOT LEND WELL TO SETTING FIXED CRITERIA FOR

TEST PROCEDURES AND PROTOCOLS FOR CLOSINGS AND REOPENINGS. WE DO AGREE WITH THE PROVISIONS OF PARAGRAPHS (B) AND (C) WHICH WILL PROVIDE GUIDANCE ON "FLOATABLES" AS THIS IS AN ISSUE OF INTENSE PUBLIC INTEREST AND ONE WHICH WE FEEL MANY STATES AND MUNICIPALITIES ARE STILL TRYING TO RESOLVE. MAINE HAS PASSED REGULATIONS FOR THE CONTROL OF BIOMEDICAL WASTE WHICH WILL GO INTO EFFECT JANUARY 1991, THUS CONTROLLING ONE OF THE MOST OFFENSIVE CLASSES OF FLOATABLE.

WITH RESPECT TO SECTION 4 OF THE BILL, WHICH PROPOSES TO AMEND SECTION 303, WE DO NOT AGREE THAT NATIONAL CRITERIA SHOULD BE ADOPTED BY THE STATES. WHILE MAINE HAS ALREADY ADOPTED CRITERIA FOR ITS WATERS, WE DO NOT AGREE THAT OTHER STATES BE REQUIRED TO MANAGE THEIR WATERS IN THIS MANNER OR THAT OUR CRITERIA OR ANY OTHER BE SUITABLE IN DIFFERING GEOGRAPHIC AREAS. WE PRESENTLY FEEL COMFORTABLE WITH OUR CURRENT MONITORING PROGRAM AND THE GUIDANCE WE HAVE ISSUED TO MUNICIPALITIES FOR SETTING ADVISORIES AND CLOSINGS.

FINALLY, WE AGREE WITH THE PROVISIONS OF SECTION 5 OF THIS BILL WHICH WILL ENCOURAGE A COOPERATIVE STUDY BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE DEPARTMENT OF COMMERCE TO FURTHER STUDY THE HEALTH OF OUR MARINE WATERS.

THANK YOU FOR THE OPPORTUNITY TO TESTIFY ON THIS IMPORTANT LEGISLATION. WE ARE AVAILABLE TO ELABORATE FURTHER ON MAINE'S EXPERIENCE IN THIS ISSUE.

TESTIMONY OF DR. HOWARD LEVENSON
OCEANS AND ENVIRONMENT PROGRAM
OFFICE OF TECHNOLOGY ASSESSMENT

BEFORE

THE SUBCOMMITTEE ON SUPERFUND, OCEAN
AND WATER PROTECTION
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ON

PUBLIC HEALTH AND MARINE WATERS

JUNE 28, 1990

Mr. Chairman:

Thank you very much for the opportunity to submit written testimony for today's hearing on S. 2706, the Beaches Environmental Assessment, Closure, and Health Act of 1990. This bill focuses on reducing undue exposure of the public to pathogens in marine recreational waters (for example, when swimming or bathing). OTA addressed this issue as part of its 1987 report, *Wastes in Marine Environments*; as you know, the Committee on Environment and Public Works was one of the original requesters of that OTA assessment.

Many of the witnesses at today's hearing will update the Committee on actions taken during the last few years to identify public health problems associated with marine recreational waters and to develop testing procedures and criteria for determining when such problems might occur. Because OTA has not conducted analytical work on these issues since its 1987 report, we believe OTA can best serve the Committee's needs by briefly summarizing its findings on: 1) the general status of U.S. coastal marine waters; 2) public health and marine recreational waters; and 3) possible shortcomings of microbiological criteria and measurement techniques.

The Status of U.S. Coastal Marine Waters

U.S. coastal waters, including estuaries, have been used for years by coastal communities and industries for the intentional disposal of various wastes (e.g., municipal sewage effluent and sludge, industrial effluent, dredged material). Such disposal, whether via dumping or pipeline discharge, has been relatively cheap and has often been the preferred short-term approach, but it also has introduced large amounts of generally undesirable substances into marine waters -- e.g., suspended solids, fecal coliform bacteria, nutrients, metals, organic chemicals, and oil and grease. Combined (storm and sanitary) sewer overflows also are important sources of these substances in some marine areas, particularly in the northeast portion of the country. Runoff (also known as nonpoint source pollution) from agricultural lands and urban areas, although not a disposal activity, also contains large amounts of some of these substances and enters marine waters in large quantities. In some waterbodies, in fact, runoff is considered the leading cause of degradation.

At the same time, coastal waters are the most important of all marine environments with respect to their commercial resources, recreational uses, and ecological roles. They provide habitat during critical portions of the lifecycles of roughly two-thirds of the fish and shellfish caught in U.S. marine waters -- this fact alone distinguishes them from freshwater lakes and rivers. The value of marine commercial and sport fishing has been estimated at over $10 billion, and tourism and other recreational pursuits in the associated shoreline areas is the lifeblood of many communities. As a result, individual citizens and fishermen, towns, and county and State governments have grown increasingly concerned about the impacts of waste disposal on harvests and tourism and on the property values of real estate located near these waters.

OTA documented numerous problems in coastal waters around the country. The degree and distribution of these problems have varied widely among different waterbodies and organisms, but no region of the country has been immune to serious effects. The problems include:

- o low dissolved oxygen levels leading, for example, to fish kills;
- o contamination of shellfish with microorganisms, leading to restrictions in recent years on about one-third of our productive shellfish areas;
- o contamination of shellfish, fish, birds, and mammals with metals and organic chemicals, in some cases leading to ulcers and tumors;
- o declines in submerged aquatic vegetation;
- o contamination of sediment with metals and organic chemicals;
- o restrictions on fishing and consumption of certain fish species;
- o restrictions on swimming; and
- o increased reporting of human diseases such as viral gastroenteritis.

As a result, OTA concluded that unless additional protective measures are taken, many U.S. coastal waters will continue to degrade or begin to do so during the next few decades. Moreover, even with total compliance, existing regulations under the Clean Water Act still are not be sufficient to maintain or improve the health of all coastal waters for several reasons:

- o Clean Water Act programs do not adequately address runoff and they do not address all important toxic pollutants;
- o urban runoff and legal pipeline discharges will increase as population and industrial development expand in coastal areas; and
- o Federal resources for sewage treatment are declining, and the ability of States and communities to fill the breach is uncertain.

From a policy perspective, the major questions that OTA raised were whether all "needy" waterbodies will receive adequate management, and whether existing and planned mechanisms at all governmental levels will be used effectively to provide such management.

Although positive steps[1] have been taken since OTA's report was released, our conclusions have not changed -- indeed, the same effects listed above continue to occur. These problems are not ours alone: on a global scale, a report issued earlier this year by the United Nations Environment Program concluded that "encroachment on coastal areas continues worldwide ... [i]f unchecked, this trend will lead to global deterioration in the quality and productivity of the marine environment."

Public Health and Marine Recreational Waters

Human pathogens are microorganisms capable of inducing human disease if appropriate conditions exist (i.e., for survival, propagation, exposure, and infection). In marine waters, human pathogens come from several sources -- raw sewage (e.g., in combined sewer overflows), urban and rural runoff, wastewater effluent from sewage treatment plants, poorly functioning septic systems, and, where dumping still occurs, sewage sludge.

Humans can be exposed to pathogens through ingesting contaminated shellfish and swimming in contaminated water. In the United States, the most important waste- and runoff-borne pathogenic agents of human disease are viruses and bacteria, with respect to both their concentrations in wastes and the environment, and the incidence of disease attributable to them. Enteric viruses (i.e., viral pathogens that affect the intestinal system) are especially significant, since they are ideally suited to be spread by contact with contaminated water.

Shellfish-Borne Disease

Large areas of coastal waters have been closed to shellfishing and/or finfishing because they are contaminated with sewage-derived microorganisms in excess of

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[1] For example, development by some States, such as New Jersey and Washington, of coastal water protection programs; revision by EPA of microbiological criteria for marine recreational waters; expansion of the National Estuary Program.

Federal standards. Since 1966, the National Shellfish Register has provided an indicator of the extent to which shellfish in U.S. waters are contaminated with coliform bacteria. In recent years, commercial shellfish harvests from roughly one-third of the productive areas in the country have been limited because of actual or potential contamination. Over 80 percent of the limited areas occur in the Gulf of Mexico and along the southern Atlantic coast, but closures have occurred in other areas as well, including portions of Boston Harbor, New York Harbor, Narragansett Bay, Delaware River estuary, Chesapeake Bay, Puget Sound, and San Francisco Bay.

While such closures have largely eliminated outbreaks of serious shellfish-borne, bacterial disease, including epidemics of typhoid and para-typhoid fever, they do cause major economic impacts. In addition, it appears that the incidence of some shellfish-borne viral disease may be increasing. For example, in the State of New York in 1982 alone, consumption of contaminated shellfish was identified as the cause of 103 different reported outbreaks of viral gastroenteritis involving over 1,000 people. Smaller outbreaks of more serious, bacterial diseases also have been reported. In a series of apparently related cases stretching back over the last 14 years, several dozen people contracted cholera after consuming shellfish harvested from coastal marshlands in southwestern Louisiana. These represent the first indigenous outbreaks of cholera in the United States since 1911.

Many observers have questioned the adequacy of programs designed to reduce the risk of human exposure to toxic chemicals or pathogens through consumption of tainted seafood. Of particular concern are urban recreational fishing and illegal commercial harvesting, both of which are widespread even in areas for which health advisories or bans on fishing have been issued.

Water-Borne Disease

While the implementation of water quality guidelines and sewage treatment requirements has substantially reduced the outbreaks of serious human diseases attributable to direct contact with polluted waters, bathing in sewage-impacted waters still appears responsible for relatively high rates of gastrointestinal illness in the United States. In fact, the number of outbreaks of water-borne disease, particularly nonbacterial diseases such as viral gastroenteritis and hepatitis, has been steadily increasing in recent decades.[2] Some epidemiologic evidence has shown that the incidence of gastrointestinal illness is significantly elevated in people swimming at several heavily used New York City beaches and in Lake Pontchartrain in New Orleans.[3] Scuba diving in contaminated marine waters can also lead to increased incidence of water-borne diseases such as dermatitis, infections, and other skin-related ailments, as well as enteric illness; these are likely to be highly under-reported.

Epidemics of serious bacterial disease, while rare, have been caused by swimming in sewage-contaminated water. For example, in 1974 an outbreak of shigellosis was traced to swimming in a stretch of the Mississippi River downstream of a secondary treatment plant. Fecal coliform counts in the river were almost 90 times higher than the Federal standard.

Shortcomings of Microbiological Criteria and Techniques

In its 1987 report, OTA concluded that techniques used to measure marine water quality provide poor estimates of the true number of viable pathogens that enter the marine environment, for at least four reasons. **First**, coliform bacteria, which have been used to indicate sewage contamination of water for over 75 years, are not the best

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[2] Much of this type of illness goes unreported because of its relatively benign nature and the underreporting significantly hinders accurate measurement of true incidence. Data on the incidence of water-borne disease do not generally distinguish between fresh and marine waters.

[3] These studies are significant because they demonstrate that not only can the presence of sewage-derived material in the marine environment result in human disease, but also that disease rates that are significant from a public health perspective can be difficult or impossible to discern in the absence of carefully performed, thorough (and expensive), epidemiologic studies.

indictors of the presence of human pathogens. They are not pathogenic themselves generally and also do not survive as well (either during chlorination at sewage treatment plants or in marine waters after effluent discharge) as viruses or other, pathogenic bacteria. In fact, gastroenteritis associated with swimming (at least in marine waters) is better correlated with enterococcal bacteria than with coliforms. In addition, outbreaks of gastroenteritis have been associated with shellfish harvested from waters that were deemed acceptable using traditional indicators.[4]

Second, existing criteria use bacteria as indicators of contamination, even though **viruses** appear to be the major cause of diseases resulting from exposure through both direct (swimming, diving) and indirect (seafood consumption) pathways. **Third**, current criteria and monitoring protocols are based primarily on water quality.[5] However, many microorganisms are more likely to survive in sediments or in marine organisms. Concentrations of microorganisms in these sources are neither regulated nor routinely monitored.

Finally, traditional tests fail to detect many bacteria in marine waters at all. Yet bacteria introduced into marine waters apparently do not die off as rapidly as once believed, but remain viable for extended periods of time (e.g., months to years) and can be reactivated within host organisms.[6] The public health significance of this phenomenon is unclear; no definitive link has been established between the long-term survival of pathogenic bacteria through this mechanism and the occurrence of human disease. Moreover, because most disease related to exposure to marine waters or fish

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[4] EPA has revised its microbiological criteria for marine recreational waters, so that measurements of enterococcal bacteria are used to indicate pathogen levels. However, the States are not required to adopt the new criteria as part of their water quality standards. Moreoever, the criteria do not address issues related to shellfish harvesting in marine waters.

[5] The classification system under the National Shellfish Register is not equivalent to a set of standards. The system is implemented voluntarily by the States, and not necessarily in a consistent manner from State to State.

[6] In addition, chlorination at sewage treatment plants may only temporarily inactivate, rather than destroy, microorganisms present in sewage effluent.

is caused by viruses, the role that pathogenic bacteria in marine waters play in human disease may be of secondary importance.

As a result of shortcomings such as these, many observers have raised concerns about the adequacy of efforts to control and monitor microbiological contamination of marine waters and resources. OTA concluded that three major issues need to be addressed:

- o criteria designed to protect humans against pathogenic microorganisms in marine waters or seafood may not be sufficient;
- o fecal coliform bacteria do not adequately measure actual pathogens; and
- o monitoring protocols seem inadequate to detect violation of criteria and standards.

Concluding Remarks

Mr. Chairman, we hope this testimony helps clarify some of the issues facing the Committee as it considers S. 2706. As currently crafted, the bill addresses many relevant issues, including research on appropriate indicators of health risks associated with marine recreational waters, pathogenicity standards and water quality testing procedures, and protocols for opening and closing beaches.

In light of the findings summarized above, it seems appropriate to hold this hearing. Along with you and your colleagues, we are eager to hear today's testimony from researchers who have continued to work on these issues. We hope they can pinpoint how far the nation has progressed in addressing the public health risks associated with recreation in marine waters.

II

101ST CONGRESS
2D SESSION

S. 2706

To improve the public safety and quality of marine recreational waters.

IN THE SENATE OF THE UNITED STATES

JUNE 5 (legislative day, APRIL 18), 1990

Mr. LAUTENBERG (for himself and Mr. BRADLEY) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To improve the public safety and quality of marine recreational waters.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Beaches Environmental Assessment, Closure, and Health Act of 1990".

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress finds that—

(1) the Nation's beaches are a valuable public resource used for recreational activities by millions of people annually;

(2) tourism in the coastal zone generates billions of dollars annually for local communities nationwide;

(3) as of 1990, more than one-half of the Nation's population lives within 50 miles of a coast and the population density in coastal counties is 5 times greater than in noncoastal counties;

(4) increased residential and seasonal population growth has contributed to the decline in marine water quality; and

(5) public welfare would be protected and enhanced by consistent standards and protocols adopted by coastal States to monitor and frequently test beaches.

(b) PURPOSE.—The purpose of this Act is to ensure uniform beach testing and monitoring nationwide to protect public health and the quality of marine recreational waters.

SEC. 3. WATER QUALITY CRITERIA FOR MARINE RECREATIONAL WATERS.

Section 304(a) of the Federal Water Pollution Control Act (33 U.S.C. 1314(a)) is amended by adding at the end the following:

"(9) MARINE RECREATIONAL WATERS.—(A) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall review and revise within 12 months after the date

of the enactment of this paragraph, and from time to time thereafter, ambient water quality criteria for marine recreational waters that are designated for bathing waters or primary bodily contact. In reviewing and revising the criteria, the Administrator shall review and revise the acceptable level of risk based on the best scientific evidence available. The criteria shall assure the protection of public health and allow recreational activities in and on the water. Criteria published by the Administrator under this subparagraph shall include—

"(i) methods to be used to test such waters, during periods of use by the public, for compliance with the criteria, including requirements for the frequency of such testing based on the frequency of use of such waters;

"(ii) criteria regarding short-term pathogenicity of such waters resulting from rainfall events, malfunctions of sewage treatment works, and other causes; and

"(iii) criteria regarding uniform testing procedures and protocols for the closing and reopening of beaches.

"(B) The Administrator, after consultation with appropriate State agencies, shall develop and publish

within 12 months after the date of enactment of this paragraph, guidance on consideration of floatables with respect to the closings and reopenings of beaches consistent with subparagraph (A).

"(C) For purposes of subparagraph (B), the term 'floatables' means material and debris that may float or remain suspended in the water column, including but not limited to plastic materials, aluminum cans, wood, bottles, and paper products.".

SEC. 4. WATER QUALITY STANDARDS FOR MARINE RECREATIONAL WATERS.

Section 303 of the Federal Water Pollution Control Act (33 U.S.C. 1313) is amended by adding at the end the following:

"(i) WATER QUALITY STANDARDS FOR MARINE RECREATIONAL WATERS.—

"(1) STATE WATER QUALITY STANDARDS.—Not later than 24 months after the date on which the Administrator publishes criteria for the quality of marine recreational waters under section 304(a)(9)(A), each State shall adopt and submit to the Administrator water quality standards based on such criteria for marine recreational waters of the State.

"(2) FAILURE OF STATE TO ADOPT WATER QUALITY STANDARDS.—If a State fails to adopt water

quality standards in accordance with paragraph (1), the criteria published by the Administrator under section 304(a)(9)(A) shall take effect as water quality standards for marine recreational waters of the State until such time as the State adopts water quality standards in accordance with paragraph (1).".

SEC. 5. STUDY TO IDENTIFY INDICATORS OF HUMAN-SPECIFIC PATHOGENS IN MARINE RECREATIONAL WATERS.

(a) STUDY.—The Administrator of the Environmental Protection Agency, in cooperation with the Under Secretary of Commerce for Oceans and Atmosphere, shall conduct an ongoing study to provide additional information to the current base of knowledge and for periodically revising the criteria consistent with section 304(a)(9)(A) of the Federal Water Pollution Control Act, for identifying indicators of human-specific pathogens in marine recreational waters.

(b) REPORT.—Not later than 36 months after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency shall submit to the Congress a report describing the results of a study under this section, including recommendations for revisions of water quality criteria applying to marine recreational waters. The report shall also include an evaluation of State efforts to meet the criteria

and guidance set forth in this Act or amendments made thereby.

SEC. 6. NO PREEMPTION.

Nothing in this Act shall be construed or interpreted as preempting any State from adopting or enforcing any law or regulation providing for more stringent criteria and standards than those provided for by this Act, or amendments made by this Act.

SEC. 7. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administrator of the Environmental Protection Agency to carry out this Act and amendments made by this Act, not to exceed $1,000,000 for each of fiscal years 1991 and 1992.

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